Ongoing Monitoring Report (October 2022 – September 2023)

HMAS Stirling

304700525

Prepared for
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Cardno

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Executive Summary

Introduction

The Australian Department of Defence ("Defence") engaged Cardno, now Stantec ("Cardno") to implement the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) (Defence, 2019)[1] at the Australian Naval Base His Majesty's Australian Ship Stirling (HMAS Stirling or "the site"), Western Australia.

The OMP, developed as part of the PFAS Management Area Plan[2] (PMAP, Defence, 2019), outlines the rationale and scope for monitoring concentrations and extent of PFAS in groundwater, porewater, surface water and sediment associated with Defence's historical use of legacy aqueous film forming foam (AFFF) at the HMAS Stirling on Garden Island. The PMAP documented ways to manage potential risks to receptors (for example, to people or the environment).

The OMP includes sampling and analysis not only from the site, but also from the marine nearshore environment surrounding the island. HMAS Stirling and these surrounding areas are collectively referred to as the 'Management Area'. PFAS source areas at the site were identified during a Detailed Site Investigation (DSI) (RPS, 2018a)[3] and have been monitored through the OMP since 2019.

Objectives

The objective of the OMP is to assess changes in the nature and extent of PFAS within the Management Area. The OMP used the monitoring network developed as part of the PMAP (Defence, 2019) to monitor the concentrations of PFAS within the Management Area.

Monitoring Scope

The monitoring program consists of quarterly collection of samples at monitoring locations within the Management Area. The scope of work for the quarterly monitoring events of the October 2022 – September 2023 monitoring period (monitoring period) included monitoring of 62 groundwater wells, 39 co-located sediment and porewater locations, and 28 surface water locations for PFAS concentrations as specified in the Sampling and Analysis Quality Plan (SAQP) (Cardno, 2023). The quarterly monitoring events were completed in December 2022, March 2023, June 2023 and September 2023.

Groundwater Results

Groundwater Flow Direction and Parameters

The depth to groundwater (gauged at monitoring wells) and groundwater flow direction for the monitoring period were consistent with historical results. Groundwater flow is following the site's topography with groundwater generally flowing in a radial direction from elevated hills in the centre of the site towards the coastline as shown in Figures 4-7, Appendix A.

Physicochemical parameters of groundwater (including but not limited to pH, dissolved oxygen and electrical conductivity) showed no seasonal change across the four sampling events. The salinity in groundwater was observed to increase the closer the monitoring wells were to the coastline. This is consistent with historical data.

PFAS Concentrations

PFAS concentrations are present in groundwater at several locations throughout the site, typically attributed to the historical storage and use of AFFF.

PFAS concentrations ranged from below the laboratory limit of reporting (LOR) (0.01 ug/L) to two orders of magnitude above the adopted criteria for the protection of recreational water users (2.0 µg/L). Isolated occurrences of results being outside the historical

What is a 'limit of reporting'?

The limit of reporting (LOR) is the lowest concentration level that the laboratory is able to measure in a sample with a reasonable degree of certainty. Where monitoring shows <LOR, it means that if PFAS is present in the sample it is too low for the laboratory to measure with any degree of certainty.

[1] The OMP is publicly available at https://www.defence.gov.au/about/locations-property/pfas/pfas-management-sites/hmas-stirling-garden-island, and is found as Attachment 1 of the PFAS Management Area Plan.
[2] Defence, 2019, PFAS Management Area Plan
[3] Publicly available at https://www.defence.gov.au/about/locations-property/pfas/pfas-management-sites/hmas-stirling-garden-island

range of concentrations were identified (i.e. new minimum and/or maximum concentrations recorded).

Concentrations of Perfluorooctane Sulfonic Acid (PFOS) and the Sum of PFOS and Perfluorohexane Sulfonic Acid (PFHxS) (PFOS+PFHxS) were generally higher at the source areas and lower at downgradient areas and towards the shoreline. This is consistent with previous years of monitoring. Perfluorooctanoic Acid (PFOA) concentrations across the monitoring network were reported below the LOR or within the same order of magnitude as the LOR, except at the source areas.

Statistical analysis was undertaken to assess the stability and extent of PFAS concentrations. Most groundwater monitoring locations displayed stable trends of PFAS indicating no change in the extent or movement of PFAS. Increasing or decreasing trends were also identified, however, none resulted in a change in our understanding of the Conceptual Site Model (CSM) or risk profile of the Management Area.

Porewater Results

Porewater is water that is present between the individual grains of sediment (sand) in the coastal environment. It is a mix of groundwater from beneath Garden Island and seawater moving with the tides. It is the interface between groundwater and surface water. The monitoring of porewater provides data to assess the potential risk of PFAS migrating to the surrounding waters of Garden Island.

What is an 'order of magnitude'?

This refers to something decreasing or increasing by multiples of ten. For instance, an increase from 10 to 100 is an order of magnitude increase. When assessing changes in PFAS concentrations at an individual location, all concentrations are considered when determining trends, but order of magnitude changes are discussed separately as they represent a significant change in concentrations from what was reported in the previous event.

If a change is close to established health or environmental criteria, it will also be considered significant.

PFOS+PFHxS concentrations in porewater ranged from below the LOR to 7.52 µg/L across the Management Area. A new maximum concentration was reported at PW346 (accommodation area) in December 2022; however, the increase was less than one order of magnitude from the previous maximum. PW346 has shown fluctuations in previous years, and all other samples collected at PW346 during the monitoring period were within historical range. This was the only exceedance of the recreational criteria (2.0 ug/L) in porewater for the monitoring period, and dispersion and dilution effects would further reduce the PFAS concentrations within the marine environment.

Surface Water Results

PFAS concentrations in surface water were not detected above the LOR for the majority of the samples analysed during the monitoring period, which is consistent with previous monitoring data. The highest concentrations of PFAS were below the adopted recreational criteria (PFAS concentrations in surface water ranged from below LOR to 0.68 µg/L).

No changes or trends in PFAS concentrations were noted for the surface water monitoring locations with only infrequent detections above the LOR.

Sediment Results

Sediment is also sampled to help understand the movement of PFAS in the environment.

No first-time detections of PFAS or magnitude of order changes were reported in sediment. No changes in the nature and extent of PFAS in sediment were observed. Only isolated detections above the LOR were noted during the monitoring period, which is consistent with previous monitoring data.

Risk Summary

A review of the sources, pathways and receptors as presented in the PMAP CSM (Defence, 2019) has been undertaken.

The findings within this report suggest that the nature and extent of PFAS in groundwater, porewater, surface water and sediment has not significantly changed compared to the results from previous monitoring periods. No new pathways, exposure scenarios or potential receptors were identified and the PFAS exposure risk to human health is considered low and acceptable.

The risk to human health receptors (including the site users and workers) was assessed in the DSI (RPS, 2018a) to be low and acceptable. An Ecological Risk Assessment (ERA) (RPS, 2018b) was completed to characterise the PFAS exposure risk to ecological receptors (including the ecosystems of the Cockburn

Sound and Indian Ocean) within the Management Area. The ERA concluded that adverse effects to the environment were unlikely to occur.

No change to the risk profile of the Management Area is interpreted based on the following:

- The analytical results collected as part of the monitoring period were predominantly within historical ranges. New maximums, new minimums, and new exceedances were noted at specific locations across the monitoring period but were not interpreted to represent significant changes as the order of magnitude of PFAS concentrations remained consistent with previous investigations. No first-time detections were reported.
- Interpretation of PFAS extent and movement with groundwater indicates that concentrations are largely stable or decreasing at the source areas, and slowly moving with groundwater flow towards the coastline. Concentrations detected at coastline monitoring locations are lower than these recorded at source areas. This is consistent with previous findings of the DSI (RPS, 2018a) and previous ongoing monitoring periods (Cardno, 2024).
- Where new concentration maximums have been reported in surface water or porewater, these did not represent an order of magnitude change and subsequently returned to the historical range during the following monitoring events in most cases.

Conclusions

Based on the data collected during the monitoring period, the following conclusions are made:

- The October 2022 – September 2023 monitoring was undertaken in accordance with the SAQP and is considered to have met the objectives of the OMP with exception of the monitoring of the ship sullage area. The groundwater monitoring network condition in this area did not allow for OMP monitoring due to wells missing or damaged.
- Interpretation of PFAS extent and movement with groundwater indicates that concentrations are stable and appear to be slowly moving away from source areas towards the coast with groundwater flow, consistent with previous findings. However, PFAS concentrations in groundwater, porewater, and surface water along the coastline are significantly lower than the source areas.
- Increasing and decreasing trends were also identified at groundwater monitoring wells across each monitoring area. However, none of these was interpreted to represent a significant change as the order of magnitude of PFAS concentrations remained consistent with previous investigations.
- Detections of PFAS in porewater and surface water were isolated and at concentrations lower than those reported in groundwater monitoring wells. The effects of dilution and dispersion at the point of discharge are likely to significantly reduce the PFAS concentrations in the marine environments of Cockburn Sound and the Indian Ocean.
- The October 2022 – September 2023 monitoring data indicated no changes to our understanding of each source area, PFAS extent and associated exposure pathways at the site. The identified risks to human health and ecological receptors within the Management Area remain low and acceptable.

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Chemical Names

DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluorohexane Sulfonate
PFOA	Per-fluorooctanoic Acid
PFOS	Per-fluorooctane Sulfonate
TDS	Total Dissolved Solids (salinity of water)

Technical Terms & Abbreviations

AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AS	Australian Standard
AST	Above-ground Storage Tank
BGL	Below Ground Level
CSM	Conceptual Site Model
DSI	Detailed Site Investigation
DWER	Department of Water and Environmental Regulation
EC	Electrical Conductivity
EPA	Environmental Protection Agency
ERA	Ecological Risk Assessment
ESA	Environmental Site Assessment
HEPA	Heads of Environment Protection Authorities
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
NEMP	National Environmental Management Plan
NEPC	National Environment Protection Council
ORP	Oxido-reduction Potential
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RWL	Reduced water level
SAQP	Sampling and Analysis Quality Plan
SWL	Standing Water Level
UST	Underground Storage Tank
WA	Western Australia

Units

ha	Hectares
mBGL	Metres Below Ground Level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
µg/L	Microgram per Litre
mV	Millivolt
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity - Water)

Site Specific

AVCAT	AViation CArrier Turbine
OMR	Ongoing Monitoring Report
OMP	Ongoing Monitoring Plan
PMAP	PFAS Management Area Plan
FTA	Fire Training Area
HSF	Helicopter Support Facility
RCIP	Regional Contamination Investigation Program
WWTP	Waste water Treatment Plant

1 Introduction

The Australian Department of Defence (Defence) engaged Cardno, now Stantec (Cardno) to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) quarterly sampling events and interpretative reporting at the Australian Naval Base His Majesty's Australian Ship (HMAS) Stirling (the site) (Figure 1, Appendix A).

1.1 Background

The PFAS OMP (Defence, 2019) outlines the rationale and scope for the monitoring of the concentrations and extent of PFAS in groundwater, porewater, surface water and sediment originating from the site. The monitoring program consists of quarterly monitoring events generally conducted in March (Q1), June (Q2), September (Q3) and December (Q4).

The OMP applies not only to the site, but also the surrounding marine nearshore areas that, together with the site, make up the "Management Area". For the purposes of this report:

- The 'site' is defined as HMAS Stirling Garden Island (Figure 1, Appendix A).
- The 'Management Area' is defined as comprising of Garden Island and the marine nearshore environment (Figure 2, Appendix A).

1.2 Purpose & Objectives

The primary objective of the PFAS OMP is to establish trends in PFAS concentration in groundwater, porewater, surface water and sediment associated with seasonal variability to confirm the current understanding of the risk. To achieve this, the monitoring specified in the OMP aims to:

- Provide ongoing data on the concentrations of PFAS in groundwater, porewater, surface water and sediment within the Management Area.
- Establish the presence or absence of trends in PFAS concentration associated with seasonally variable rainfall and consequent changes in groundwater flow direction and height.
- Confirm the level of risk described in the DSI (RPS, 2018a) and ERA (RPS, 2018b).

The specific objectives of this Ongoing Monitoring Report (OMR) are to:

- Inform Defence and key stakeholders of PFAS concentration trends in groundwater, porewater, surface water and sediment.
- Assess any variations in the distribution of PFAS and how this changes the understanding of the conceptual site model and risk profile.
- Make recommendations for any potential changes regarding the location and frequency of future sampling that may be incorporated into the OMP (provided to Defence in a separate letter to this OMR).

1.3 Scope of Work

The PFAS OMP was carried out in general accordance with the scope and limitations presented in Cardno's Sampling and Analysis Quality Plan (SAQP, Appendix B):

- Cardno, August 2023, Reference: DEF19009, Rev.11 *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling* (Appendix B).

The SAQP was reviewed and updated as required prior to each monitoring event. Deviations from the SAQP are summarised in Section 3.7.

Cardno carried out the following tasks to satisfy the purpose and objectives of this assessment:

- Quarterly monitoring of on-site groundwater wells (gauging and sampling); and
- Quarterly sampling of porewater, surface water and sediment within the Management Area.

The OMP outlines the rationale and scope for the monitoring of the concentrations and extent of PFAS in groundwater, porewater, surface water and sediment originating from the site. This OMR covers the monitoring period from October 2022 to September 2023 (monitoring period).

1.4 Standards of Assessment and Limitations

This OMR has been prepared in accordance with the current industry standards for an assessment of this type for the purpose, objectives and scope identified in this report.

This report is not any of the following:

- A Mandatory Audit Report (MAR) or Voluntary Audit Report (VAR) as defined under the *Contaminated Sites Act 2003* (CS Act).
- A Geotechnical Assessment.
- A Detailed Site Investigation (DSI).
- A Detailed Hydrogeological Assessment.
- A Remediation Action Plan (RAP) or Site Remediation & Validation (SRV) report.
- A Site Management Plan (SMP).

2 Site Setting

The site is located on Garden Island within Cockburn Sound, situated approximately 4 km off the Western Australia (WA) mainland and connected to the mainland via a bridge in the south of the Island. The site is 12 km long and 1.5 km wide at its widest point and covers an area of 1,274 hectares (ha).

Defence facilities occupy approximately 28% of the site, with the majority focused around Careening Bay on the southeast, with other support facilities located in other portions of the site.

The buildings and associated infrastructure and support services include:

- Accommodation blocks.
- Helicopter Support Facility (HSF).
- Fire Station.
- Fuel Farm.
- Flammable/Hazardous Goods and Waste Storage.
- Aviation Carrier Turbine (AVCAT) Storage Facility.
- Wastewater Treatment Plant (WWTP).
- Seepage ponds.
- Shipping berths and ship sullage area.
- Maintenance and workshop areas.
- Demolition ground; and
- Fire Training Area (FTA).

2.1 Site Definition and Planning

The site location is presented in Figure 1, Appendix A. Key site identification details are presented in Table 2-1.

Table 2-1 Site Identification Details

Details	Description
Site Address	Garden Island, WA
Land Description	HMAS Stirling
Owner	Commonwealth of Australia
Title Details	Lot 9 on Plan 226190
Planning Zone / Land use	Public Purposes – Government Services / Naval Base
Local Government Authority (LGA)	City of Rockingham

2.2 Surrounding Land Uses and Zoning

The surrounding land uses are outlined in Table 2-2.

Table 2-2 Surrounding Land Uses

Direction	Land Use
North	Carnac Island Nature Reserve / Indian Ocean
West	Indian Ocean
East	Cockburn Sound / Kwinana Industrial Area
South	Warnbro Sound / City of Rockingham

2.3 Management Area Description

The OMP includes sampling and analysis from a number of groundwater monitoring wells, co-located porewater and sediment locations and surface water locations. The Management Area boundaries are presented in Figure 2, Appendix A.

The Management Area as described in the PFAS Management Area Plan (PMAP) (Defence, 2019) includes HMAS Stirling, Garden Island and the near shore marine environment surrounding Garden Island.

2.4 Environmental Setting

Key details defining the site are summarised in Table 2-3.

Table 2-3 Key Site Details

Setting	Description
Climate	The Perth region, including Garden Island has a warm summer, cold winter Mediterranean climate. Mean maximum temperatures on the Island occur in February (28.3 ºC) while mean minimum temperatures occur in July (11.2 ºC). Rainfall is winter dominant, with the highest volume of rainfall typically occurring in July with a mean monthly rainfall of 115.5 mm.
Topography	Topography on Garden Island ranges from sea level, zero metres relative to the Australian Height Datum (mAHD) along the eastern coastline to 55 mAHD within the middle of the Island. Steep dunes and limestone cliffs of up to ten mAHD characterise the western perimeter of the Island, whilst the eastern perimeter is relatively flat.
Geology	**Regional Geology** Garden Island is an offshore outcrop of Tamala Limestone and part of the Garden Island Ridge, the WA Department of Mines and Petroleum 1:50,000 geological map series indicates the surface is Calcareous Sand (S2 and S13) (i.e., Safety Bay Sand – white medium grained rounded quartz and shell debris well sorted of eolian origin). **Site Specific Geology** Bore logs from the drilling of groundwater wells and soil cores during previous sampling programs (ENSR 2009, RPS 2018a) indicate the geology of the site varies with topography. The demolition ground in the north coast of the Island contains Safety Bay Sand to at least five metres below ground level (mBGL), and at the WWTP Safety Bay Sands were encountered down to 29 mBGL. Layers of limestone were encountered in certain areas (e.g., Fire Training Area at 1-2 mBGL and around the WWTP at 7-15 mBGL). Fill sands containing brick rubble and limestone cobbles were also encountered in the Fire Training Area to a depth of one mBGL.
Acid Sulfate Soil	A review of the Acid Sulfate Soils (ASS) risk mapping, available on the WA Atlas online database indicates no known risk of ASS occurrence within three metres of natural ground surface for the site.

Setting	Description
Hydrogeology	▪ **Groundwater Occurrence** – The superficial aquifer at Garden Island, whilst geologically connected, is not hydraulically connected to the superficial aquifer of the mainland as both discharge to the near shore marine environment. The underlying confined aquifers, the Leederville and deeper Yarragadee, typically extend tens of kilometres offshore beneath the seabed and are thought to discharge terrestrial groundwater to the ocean several kilometres from the coast (Davidson, 1995). At the south of the Island the superficial aquifer extends to a depth of around 20 mBGL, with an aquitard (Kings Park Formation) at ~90 mBGL, overlying the Kardinya Shale around 140 mBGL, overlying the Leederville aquifer at ~165 mBGL. In the north of the Island, the Kardinya Shale is present at significantly shallower depth than in the south (~37 mBGL) and forms an aquitard to the deeper Leederville Formation at ~181 mBGL. ▪ **Depth to Groundwater** – The depth to groundwater is affected by the topography of the Island. Along the coastline groundwater is found at shallow depth (2-3 mBGL), whilst around the WWTP groundwater is up to 21 mBGL. The depth to groundwater, especially along the coastal fringes, will be influenced by tides within the surrounding marine environment. ▪ **Groundwater Flow Direction** – Groundwater flow direction is interpreted to be towards the marine environment, with flow on the east of the dunal system towards Cockburn Sound and flow towards the Indian Ocean on the west of the dunal system. Tidal pressure can influence localised flow direction in the vicinity of the coastline. ▪ **Salinity –** The superficial groundwater is classified as brackish by the Department of Water and Environmental Regulation (DWER) Perth Groundwater Atlas, with a total dissolved solids (TDS) in the range of 1,000 – 3,000 mg/L. ▪ **Groundwater Use** – Groundwater is not abstracted on the Island for potable or non-potable use. Potable water for Garden Island is supplied from the Rockingham town water supply. The DWER groundwater database found two registered abstraction bores (Leederville Aquifer) on the mainland within 20 km of Garden Island. These bores are used for irrigation and industry. RPS ruled out any risk of PFAS impact to these bores according to the calculated groundwater travel time (RPS, 2018a).
Environmental Sensitive Areas	Due to its significant natural and cultural heritage values, the Island is protected by the *Environment Protection and Biodiversity Act 1999* (EPBC Act). Several vulnerable species of flora have also been listed as endangered ecological communities. The vegetation on the Island is also included in Bush Forever Site 63, with the Bush Forever policy providing a framework for bushland protection and management issues in WA. Additionally, the seagrass meadows along the eastern margin of Garden Island are a significant remnant population of seagrass in Cockburn Sound and are protected under the *State Environmental (Cockburn Sound) Policy 2015*.
Note: Further information can be found in the DSI (RPS, 2018a) and previous PFAS OMP reports.	

2.5 Source Areas

Ten main source areas for PFAS contamination were identified during the DSI (RPS, 2018a) and associated with risks to receptors as identified in the PMAP (Defence, 2019):

- FTA.
- HSF.
- Demolition ground.
- WWTP and associated seepage ponds.
- AVCAT storage, fuel farm and drainage swale.
- Fire station.
- Dredged sediments.
- Ship sullage area.
- Flammable/hazardous goods and waste storage; and
- Accommodation area.

PFAS were detected in all media tested (groundwater, porewater, surface water and sediment). The highest concentrations in soil were observed in the source areas. PFAS concentrations in groundwater tested during the DSI (RPS, 2018a) were generally low across the site, with higher concentrations in the immediate vicinity of the source areas. The PFAS source areas identified by RPS are shown in Figure 2, Appendix A.

In addition to the above, GHD identified additional potential source areas through a Stage 1 Preliminary Site Investigation (PSI) (GHD, 2019), namely (also shown in Figure 2, Appendix A):

- Building 54 Group of Underground Storage Tanks (UST); and
- Sewage treatment at the Torpedo Maintenance Facility and Explosive Area E3.

3 Sampling and Analytical Methodology

3.1 Sampling Dates

A summary of the dates for each sampling event of the monitoring period is presented in Table 3-1.

Table 3-1 Summary of Sampling Dates

Sampling event	OMR activity	Sampling period
2022 Q4 – First Quarterly Monitoring Event	Groundwater monitoring (sampling and gauging)	12 – 13 December 2022
	Surface water, porewater and sediment sampling	
2023 Q1 - Second Quarterly Monitoring Event	Groundwater monitoring (sampling and gauging)	13 – 15 March 2023
	Surface water, porewater and sediment sampling	
2023 Q2 – Third Quarterly Monitoring Event	Groundwater monitoring (sampling and gauging)	6 – 8 June 2023
	Surface water, porewater sediment sampling	
2023 Q3 - Fourth Quarterly Monitoring Event	Groundwater monitoring (sampling and gauging)	4 – 5 & 11 September 2023
	Surface water, porewater and sediment sampling	

3.2 Changes to the Monitoring Network Condition

During the monitoring period, the following changes to the monitoring network condition were observed:

- MW147 at the demolition ground was unblocked and sampled during Q1 2023.
- The sand stockpile near MW239 was removed prior to Q1 2023 and the monitoring well is no longer at risk of being compromised.
- Cardno was informed that GHD had reconditioned monitoring wells MW220 (HSF) and MW112 (FTA) prior to Q2 2023. Reconditioning works including clearing of blockages to original wells' depths as detailed below:
  - MW220: A pushtube sample liner was used to dislodge/remove roots from within the well. A submersible pump was then used to develop the well (water was purged until it ran clear, ~15 L).
  - MW112: The drillers alternated between using the submersible pump and disturbing sand within the well (using a pushtube sample liner) until the sand was removed from the well (water ran clear, ~15-20 L).
- Monitoring well MW197 PVC casing was found with the screen silted up (filled with fine sediment) during Q3 2023 and unable to be unblocked due to the casing diameter being too narrow.
- Monitoring well MW199 was found blocked with a suspected bent casing below ground level during Q3 2023.
- The access to MW172 was lost in dense vegetation and deemed unsafe to access during Q3 2023.
- Monitoring well MW258 was cleared with a steel bailer during Q3 2023 to prevent root blockage for the next monitoring event.

Further information regarding changes to the monitoring network and deviations with the SAQP (Cardno 2023, Appendix B) are found in Section 3.7.

3.3 Groundwater Sampling

Sampling of selected groundwater monitoring wells was performed in general accordance with the SAQP (Cardno 2023, Appendix B) with the exception of those deviations noted in Section 3.7 of this report,

applying methods set out in Section 6.3.3 of the SAQP. The groundwater wells monitored as part of the OMP are shown in Figures 3A-F, Appendix A. Monitoring of the ship sullage area could not be completed due to the groundwater monitoring wells lost or damaged during previous monitoring periods.

3.4 Porewater Sampling

Sampling of selected porewater monitoring locations was performed in general accordance with the SAQP (Cardno 2023, Appendix B) with the exception of those deviations noted in Section 3.7 of this report, applying methods set out in Section 6.4.4 of the SAQP. The porewater locations monitored as part of the OMP are shown in Figures 3A-F, Appendix A.

3.5 Surface Water Sampling

Sampling of selected surface water monitoring locations was performed in general accordance with the SAQP (Cardno 2023, Appendix B) with the exception of those deviations noted in Section 3.7 of this report, applying methods set out in Section 6.4.3 of the SAQP. The surface water locations monitored as part of the OMP are shown in Figures 3A-F, Appendix A.

3.6 Sediment Sampling

Sampling of selected sediment monitoring locations was performed in general accordance with the SAQP (Cardno 2023, Appendix B), applying methods set out in Section 6.4.4 of the SAQP. The sediment locations monitored as part of the OMP are shown in Figures 3A-F, Appendix A.

3.7 Deviations from the OMP SAQP

Deviations from the SAQP (Cardno 2023, Appendix B) for the monitoring period are summarised in Table 3-2.

Table 3-2 Summary of Deviations from the OMP SAQP

Location	Deviation	Justification/Discussion
2022 Q4 First Quarterly Monitoring Event (December 2022)		
MW147	Not sampled	Well blocked at 2.5mbgl. Medium impact, no data collected. It is also observed that this monitoring well is within dense overgrown bush and therefore access for repairs and ongoing sampling appear difficult.
MW496	Sampled	Sampled in replacement of nearby damaged well MW248 (removed from the SAQP). Replacement location deemed suitable as at proximity (<50 m) to the damaged well, and similar screen depth (3.5 – 8.0 mBGL). Positive impact on the OMP – collection of additional PFAS data.
2023 Q1 Second Quarterly Monitoring Event (March 2023)		
MW128	Not sampled	Well found dry, limited impact on dataset, monitoring is undertaken quarterly, and this location will be sampled in Q2 2023. Other wells targeting the FTA were sampled during Q1 2023.
MW236	Not sampled	Well found dry, limited impact on dataset, monitoring is undertaken quarterly, and this location will be sampled in Q2 2023.
MW220	No standing water level (SWL) recorded	SWL could not be recorded due to unreliable reading with the dip metre. No impact, nearby wells' SWL were used to draw inferred groundwater contours.
MW282	No field parameters recorded	Insufficient amount of water left in HydraSleeve® to take field readings. No impact, wells are monitored quarterly, and field parameters are not driving any critical OMP decisions.

Location	Deviation	Justification/Discussion
2023 Q2 Third Quarterly Monitoring Event (June 2023)		
MW121, MW233	No SWL recorded	SWL could not be recorded due to unreliable reading with the dip metre attributed to moisture in the well casing. No impact, nearby wells' SWL were used to draw inferred groundwater contours.
MW109, MW112, MW120, MW121, MW123, MW158, MW161, MW166, MW171, MW172, MW196, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW288, MW500 PW304, PW346, PW368 SW305, SW371, SW372, SW372	No field parameters recorded	Water Quality Meter (WQM) 1 reader failed on day 1 of the monitoring event. WQM2 ran out of battery on day 2 of the monitoring event. Low impact on OMP, field parameters are not driving any major decisions. WQM1 was replaced on day 2 and WQM2 battery was changed on day 3.
SW383	Not analysed	Sample was lost in the field. No impact on the OMP, adjacent locations were sampled, and this location has been monitored quarterly since the start of the program with only two samples recording PFAS concentrations above the LOR in 2018 and 2020.
2023 Q3 Fourth Quarterly Monitoring Event (September 2023)		
MW195S, MW196	Not sampled	Wells were found dry - Limited impact, wells seasonally found dry, nearby wells were sampled.
MW197	Not sampled	Well casing silted up, unable to unblock with a steel bailer due to the size of PVC casing (too narrow). Limited impact, location was monitored quarterly, sufficient temporal data obtained.
MW199	Not sampled	Casing blocked (bent) below ground level, unable to unblock with a steel bailer. Moderate impact, several bores were not sampled (dry or blocked) in the area.
MW172	Not sampled	No access track, overgrown vegetation, high risk of snake encounter. Limited impact – other wells sampled at the WWTP.
MW233	No SWL recorded	SWL not recorded in field records. No impact, nearby wells' SWL were used to draw inferred groundwater contours.
MW282	Not sampled	Insufficient water in HydraSleeve® to collect a sample. Limited impact, nearby wells monitoring the HSF were sampled.
MW214, MW215	No field parameters recorded	Insufficient water in HydraSleeve® to take field parameters readings. No impact on OMP.

4 Quality Control / Quality Assurance

A critical aspect of site assessments is the demonstration of the quality of the data used as the basis for the assessment. This is achieved through a Data Validation process which includes a review of the following data quality indicators, as described in the SAQP (Cardno 2023, Appendix B):

- Quality assurance (QA) documentation.
- Bias.
- Data Representativeness.
- Data Precision & Accuracy.
- Laboratory Performance.
- Data Comparability; and
- Data Set Completeness.

The laboratories have undertaken different quality control (QC) measures in all sets of sample analysis which validate the accuracy of their techniques. The laboratories are appropriately certified [accredited by the National Association of Testing Authorities (NATA)] for environmental sample analysis. It is considered that the analytical results are accurate and reliable for the purposes of this assessment.

Field QC protocols were adopted to ensure all samples were collected in accordance with applicable industry standards and guidance, and the methodologies described in the SAQP (Cardno 2023, Appendix B). The field staff involved in sampling were experienced in performing these duties and complied with the procedures detailed in the SAQP. Collection of QA/QC samples and calibration of field equipment as well as decontamination practices ensured the samples and field data were collected in a consistent and reliable method.

The data validation process (refer to the Factual Reports in Appendix C) has concluded that there are no significant systematic errors in the data collection process. Therefore, the data set used as the basis for this assessment is considered valid and complete.

5 Assessment Criteria

5.1 Groundwater, porewater and surface water

The assessment levels adopted for groundwater and surface water in the OMP are based upon the Heads of Environmental Protection Authorities (HEPA) Australia and New Zealand (2020) *PFAS National Environmental Management Plan (NEMP) 2.0*. These criteria were adopted in relation to the exposure pathways and potential receptors identified in the conceptual site model (CSM) during the investigation stage (DSI and ERA).

The adopted assessment criteria for groundwater, porewater and surface water are detailed in Table 5-1.

Table 5-1 Criteria for Groundwater, Porewater and Surface water

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	µg/L		
Incidental ingestion Human Health – Drinking Water Quality Guideline	0.07[1]	0.56	NHMRC 2019, HEPA 2020
Recreational Use Human Health – Recreational Water	2[1]	10	NHMRC 2019, HEPA 2020
Ingestion/uptake Ecological – 99% species protection	0.00023[2]	19	HEPA 2020

1. Sum of PFOS and PFHxS.
2. PFOS only; Practical screening guideline of 0.01 µg/L is based on typical current laboratory limit of reporting. Therefore, it should be noted that warning and action levels would not be relevant until the detection limits are reduced, or the screening levels are increased (HEPA 2020).

PFOS – Per-fluoro-octane sulfonate.
PFHxS – Per-fluoro-hexane sulfonate.
PFOA – Per-fluoro octanoic Acid.

5.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. Sediment results will be compared to the historical data range for each location monitored.

6 Contextual and Ancillary Information

6.1 Additional Analytical Data

All data available on the ESdat database at the time of reporting for each OMP monitoring location was utilised to form the basis of the interpretations and conclusions presented in this report. This data encompasses all historical data from the groundwater, porewater, surface water and sediment sampling locations. Each sampling location has been monitored for a different timeframe with some locations containing historical results from as far back as 2010. This historical data can be found in Tables 1-4 of Appendix D. No additional PFAS data outside of the results obtained from the OMP was provided for the monitoring period.

6.2 Remediation and Infrastructure Projects

No remediation projects or infrastructure works that could affect the interpretation of monitoring results were observed at the site during the monitoring period.

Field observations noted construction works were ongoing within the accommodation area and main Base area during the monitoring period, however, did not include dewatering or deep excavations works and therefore, are not considered to have affected the results.

6.3 Climate

Rainfall is potentially the most significant meteorological factor that can influence PFAS migration through groundwater recharge and subsequent flow. Monthly rainfall for all months between January 2018 and December 2023 [measured at Bureau of Meteorology (BoM) station 009256, Garden Island HSF] are displayed in Figure 6-1.

Heavy rainfall was recorded at the BoM station 9256 (HSF, Garden Island) with more than 25mm of rainfall recorded daily for three days (5-7 June 2023) at the start of the Q2 2023 monitoring event. This has the potential to have impacted groundwater contours and local flow direction with the amount of freshwater infiltration through the sandy grounds at the site. A slightly higher water table was observed during the June 2023 monitoring event in comparison to other events. No other significant weather event was recorded during the October 2022 – September 2023 monitoring events.

Monthly maximum mean temperatures recorded between 2018 and 2023 are mostly consistent with the monthly mean maximum data (2001-2022), with no noticeable variation recorded during the monitoring period (Figure 6-2).

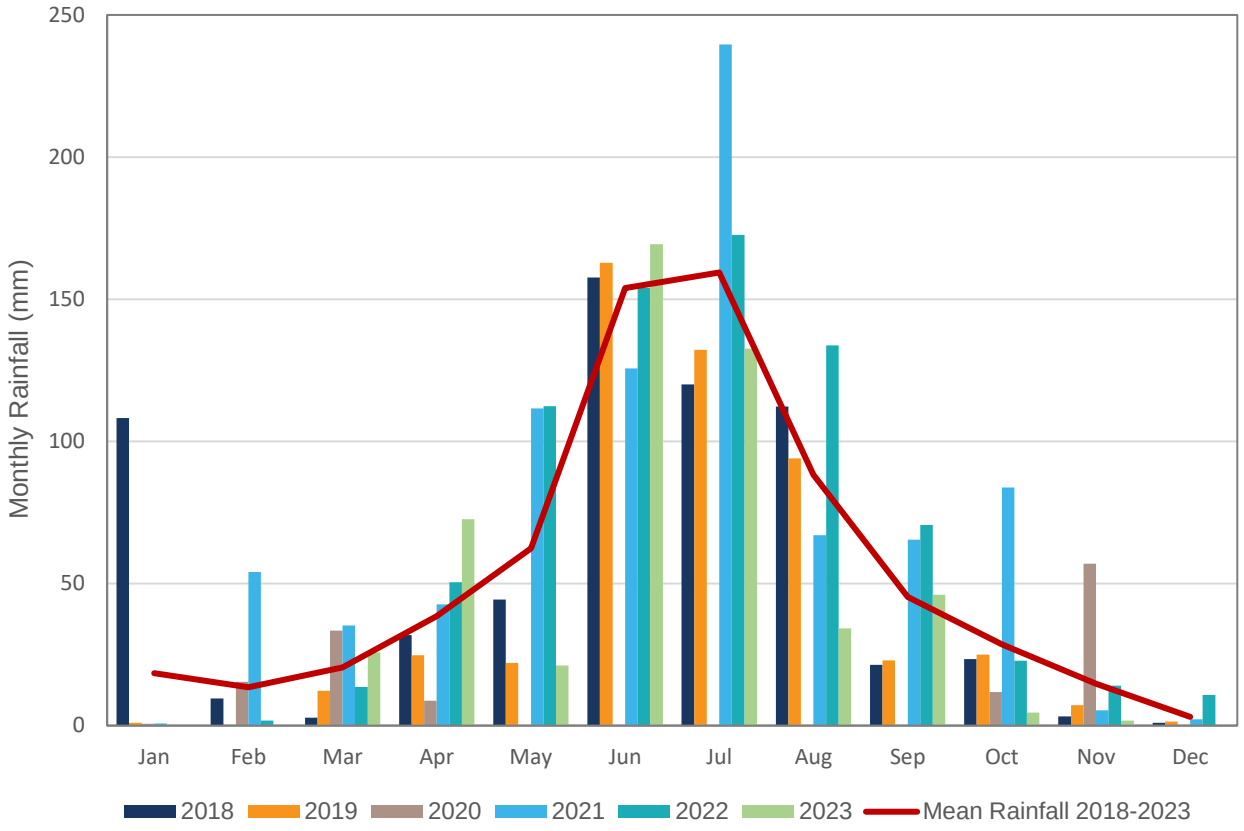


Figure 6-1 Monthly rainfall and long term mean monthly rainfall for Garden Island HSF (station 009256) BoM, 2024)

Note: No rainfall data was available from BoM for May 2020 to September 2020.

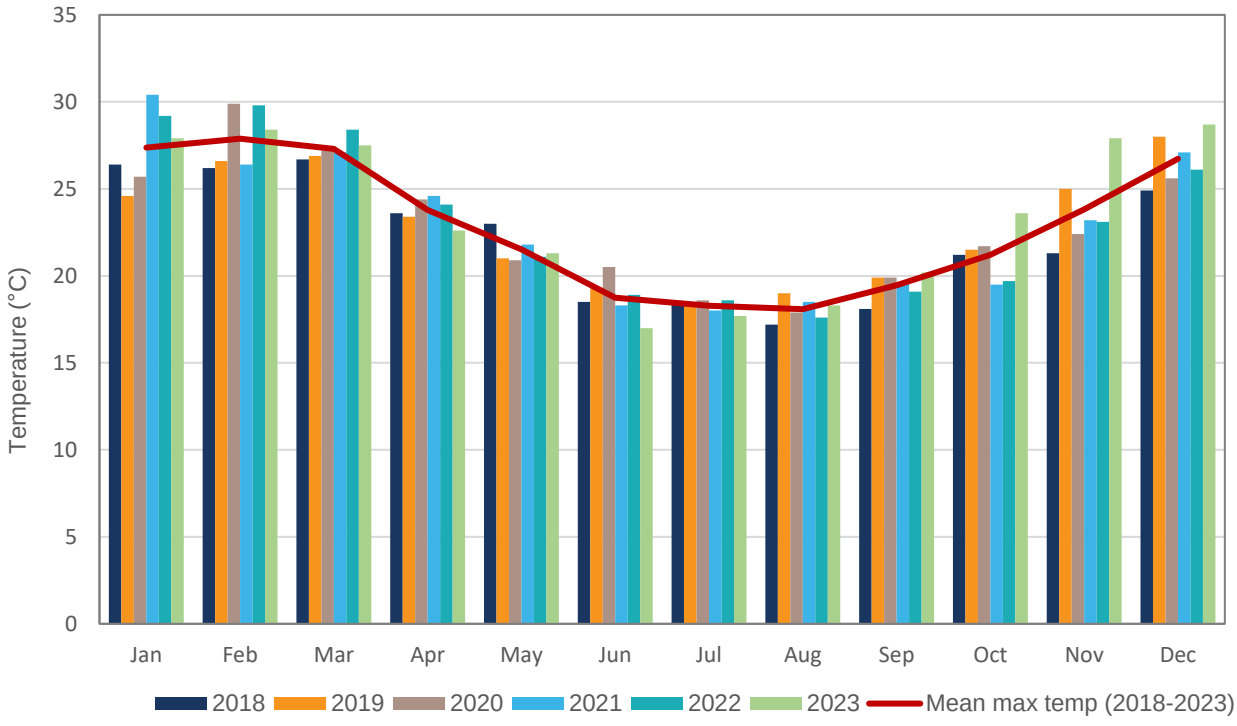


Figure 6-2 Monthly mean max temperature and long term mean monthly max temperature Garden Island HSF (station 009256) (BoM, 2024)

7 Monitoring Data Summary

The quarterly monitoring results are presented within Cardno's Factual Reports provided in Appendix C. A summary is presented in the following sections.

Physicochemical parameters recorded at each monitoring location during the quarterly monitoring events are provided within the field records tables (Tables 5-8) in Appendix D. Summary tables of laboratory analytical results are provided in Tables 1-4, Appendix D.

Sum of PFOS and PFHxS concentration maps for groundwater, porewater and surface water are presented in Appendix A:

- Figures 8A-C for the December 2022 quarterly event.
- Figures 9A-C for the March 2023 quarterly event.
- Figures 10A-C for the June 2023 quarterly event; and
- Figures 11A-C for the September 2023 quarterly event.

PFOA concentration maps for groundwater, porewater and surface water are presented in Appendix A:

- Figures 12A-C for the December 2022 quarterly event.
- Figures 13A-C for the March 2023 quarterly event.
- Figures 14A-C for the June 2023 quarterly event; and
- Figures 15A-C for the September 2023 quarterly event.

Sum of PFOS and PFHxS concentration maps for sediment are presented in Appendix A:

- Figures 16A-C for the December 2022 quarterly event.
- Figures 17A-C for the March 2023 quarterly event.
- Figures 18A-C for the June 2023 quarterly event; and
- Figures 19A-C for the September 2023 quarterly event.

7.1 Groundwater

7.1.1 Groundwater Physicochemical Parameters

Groundwater physicochemical parameters recorded during the quarterly monitoring events are summarised in Table 7-1 and provided within Table 5, Appendix D.

Table 7-1 Groundwater Physicochemical Parameters

Parameter	December 2022	March 2023	June 2023	September 2023
DO	0.30 mg/L (MW124) – 7.37 mg/L (MW196) *Anaerobic to aerobic conditions*	0.16 mg/L (MW125) – 6.5 mg/L (MW224) *Anaerobic to aerobic conditions*	0.71 mg/L (MW256) – 5.83 mg/L (MW257) *Anaerobic to aerobic conditions*	0.28 mg/L (MW127) – 9.55 mg/L (MW224) *Anaerobic to aerobic conditions*
EC	229.1 µS/cm (MW203) – 48,864 µS/cm (MW149) *Fresh to saline conditions*	342.1 µS/cm (MW233) – 52,750 µS/cm (MW149) *Fresh to saline conditions*	274 µS/cm (MW233) – 50,393 µS/cm (MW149) *Fresh to saline conditions*	13.9 µS/cm (MW224) – 41,286 µS/cm (MW226) *Fresh to saline conditions*
pH	6.68 (MW124) – 8.14 (MW233) *Near neutral to alkaline conditions*	6.56 (MW214) – 8.28 (MW233) *Near neutral to alkaline conditions*	7.01 (MW282) – 8.08 (MW233) *Near neutral to alkaline conditions.*	6.73 (MW141) – 8.1 (MW257) *Near neutral to alkaline conditions*
ORP*	-126.7 mV (MW127) – 355.2 mV (MW242) *Reducing to oxidising groundwater conditions.*	-120.3 mV (MW126) – 347.6 mV (MW136) *Reducing to oxidising groundwater conditions.*	-70.5 mV (MW126) – 341.8 mV (MW236) *Reducing to oxidising groundwater conditions.*	-97.3 mV (MW127) – 366.5 mV (MW227) *Reducing to oxidising groundwater conditions.*

*Oxido-Reduction Potential (ORP) was corrected from field reading (Eh+200mV)

No seasonal variation was observed in the groundwater physicochemical parameters. Groundwater salinity increases with proximity to the coastline.

7.1.2 Groundwater Elevations and Migration Contours

Groundwater levels and flow directions recorded during the quarterly monitoring events are summarised in Table 7-2 and gauging data is provided within Table 9, Appendix D. The inferred groundwater contours for each monitoring event are presented in Figures 4 to 7, Appendix A.

Table 7-2 Groundwater Levels and Flow Direction

Item	December 2022	March 2023	June 2023	September 2023
Depths to groundwater	1.42 mbTOC* (MW226) – 28.694 mbTOC (MW171)	1.62 mbTOC (MW226) – 28.33 mbTOC (MW171)	1.17 mbTOC (MW124) – 28.58 mbTOC (MW171)	1.63 mbTOC (MW127) – 28.76 (MW171)
Groundwater elevation	-0.16 mAHD (MW200) – 0.544 mAHD (MW171)	-1.02 mAHD (MW236) – 0.91 mAHD (MW171)	0.132 mAHD (MW496) – 1.17 mAHD (MW195S)	0.01 (MW217) – 0.66 (MW166)
Inferred direction of groundwater flow	Groundwater flow direction is interpreted to be radial from Garden Island where mounding is occurring with rainfall infiltration. Groundwater flows toward Cockburn Sound on the east and towards the Indian Ocean on the west of the Island.			
Seasonal difference in groundwater elevation	Groundwater levels were generally consistent between monitoring events, with average SWL readings of 0.24 mAHD (December 2022), 0.26 mAHD (March 2023), 0.47 mAHD (June 2023) and 0.25 mAHD (September 2023).			

*Metres below Top of Casing (mbTOC)

Groundwater elevations and flow direction for the monitoring period were consistent with historical data. Groundwater levels in wells close to the shoreline are expected to be influenced by tidal effects.

7.1.3 Groundwater Results Summary

A number of monitoring locations are targeting the source areas and downgradient areas as shown in Figures 3A-3F, Appendix A.

7.1.3.1 Fire Training Area

A summary of the PFOA and Sum of PFOS and PFHxS[4] concentrations for the monitoring period and the historical concentration ranges for the FTA monitoring locations is presented in Table 7-3 and plotted in Figure 7-1.

- PFOS+PFHxS concentrations exceeded the recreational criteria of 2 µg/L at all monitoring wells within the source area (MW109, MW112, MW120, MW121, MW123, MW128 and MW500) during at least one monitoring event of the monitoring period. The drinking water criteria of 0.07 µg/L was exceeded in all samples at the above locations.
- PFOA concentrations were below the adopted assessment criteria at all locations.
- New PFOS+PFHxS concentration minimums were identified at MW120 (September 2023), MW121 (December 2022), MW123 (December 2022), MW128 (June and September 2023) and MW500 (December 2022 and March 2023). New PFOA concentration minimums were identified at MW121 (December 2022), MW128 (June 2023) and MW500 (December 2022 and June 2023).
- MW123 reported a new PFOS+PFHxS concentration maximum which was a new exceedance of the recreational criteria during the March 2023 monitoring event. The result was within the same order of magnitude as historical maximum.
- No first-time detections of PFOA or PFOS+PFHxS were identified at the FTA during the monitoring period.

[4] It is noted that PFHxS concentrations were not analysed prior to 2017 and the Sum of PFOS and PFHxS was not reported by the laboratory before 2019. The Sum of PFOS and PFHxS was calculated from PFOS and PFHxS concentrations for the 2017-2018 data.

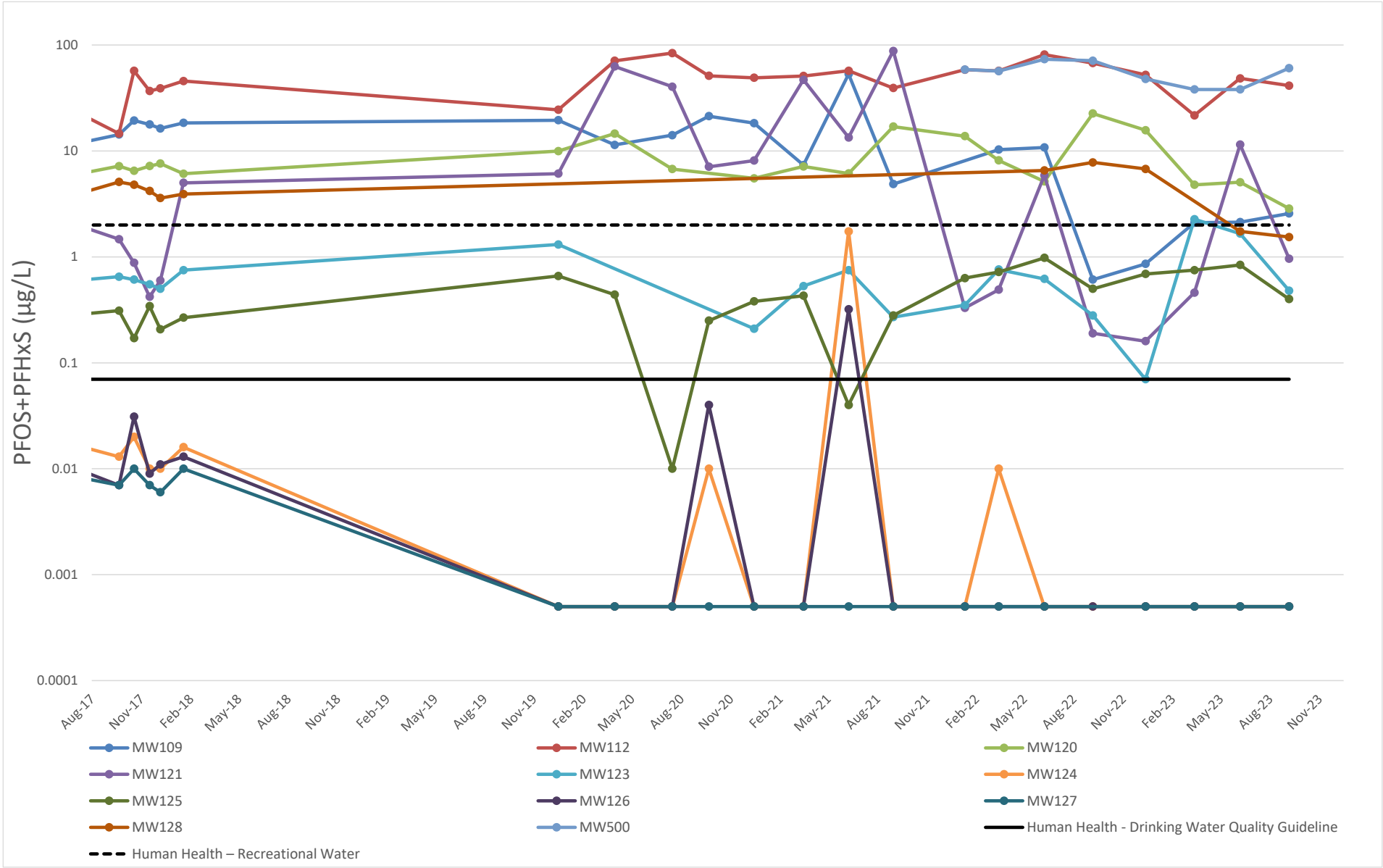
Table 7-3 FTA PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min - Max	Dec-22	Mar-23	Jun-23	Sep-23
MW109	PFOS+PFHxS	0.61 – 53.2	0.86	2.10	2.13	2.57
	PFOA	0.01 – 0.94	0.02	0.04	0.04	0.07
MW112	PFOS+PFHxS	14.6 – 83.9	52.3	21.7	48.4	41.4
	PFOA	0.56 - 7.3	0.68	1.72	4.38	1.58
MW120	PFOS+PFHxS	4.6 – 17.0	15.7	4.79	5.07	2.86
	PFOA	0.12 – 2.19	1.60	1.47	0.17	0.12
MW121	PFOS+PFHxS	0.19 – 87.9	0.16	0.46	11.5	0.96
	PFOA	0.029 – 1.42	0.02	0.03	0.60	0.05
MW123	PFOS+PFHxS	0.21 – 1.66	0.07	2.27	1.66	0.48
	PFOA	0.005 - 0.02	<0.01	<0.01	<0.01	<0.01
MW124	PFOS+PFHxS	<0.01 – 1.74	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - 0.05	<0.01	<0.01	<0.01	<0.01
MW125	PFOS+PFHxS	0.01 - 0.98	0.69	0.75	0.84	0.40
	PFOA	<0.001 - 0.002	<0.01	<0.01	<0.01	<0.01
MW126	PFOS+PFHxS	0.007 - 0.32	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW127	PFOS+PFHxS	0.005 - 0.015	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW128	PFOS+PFHxS	2.62 – 7.79	6.76	NS	1.76	1.54
	PFOA	0.029 - 0.14	0.05	NS	<0.01	<0.01
MW500	PFOS+PFHxS	56.7 – 73.5	47.9	38.1	38.1	60.5
	PFOA	1.22 – 2.12	0.78	1.2	0.51	1.2

New Maximum **New Minimum** **New Exceedance**

Note: NS- Not Sampled

Figure 7-1 FTA PFOS+PFHxS concentration trends (µg/L)



Note: A logarithmic scale was used for the vertical axis

7.1.3.2 Demolition Ground

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the demolition ground monitoring locations is presented in Table 7-4 and plotted in Figure 7-2.

- The recreational criteria for PFOS+PFHxS continued to be exceeded at MW141 and MW142, with results at these monitoring wells remaining within historical ranges.
- PFOA concentrations were not reported above the LOR at monitoring wells MW139, MW147 and MW149. PFOA concentrations at MW141 continued to exceed the drinking water criteria of 0.56 µg/L but remained below the recreational criteria of 10 µg/L.
- A new PFOA concentration minimum was recorded at MW141 in September 2023.
- A new PFOS+PFHxS concentration maximum was recorded at MW147 in June 2023 immediately followed by a new minimum in September 2023.
- No new exceedance of the assessment criteria, or first-time detection of PFOA or PFOS+PFHxS, were identified at the demolition ground during the monitoring period.

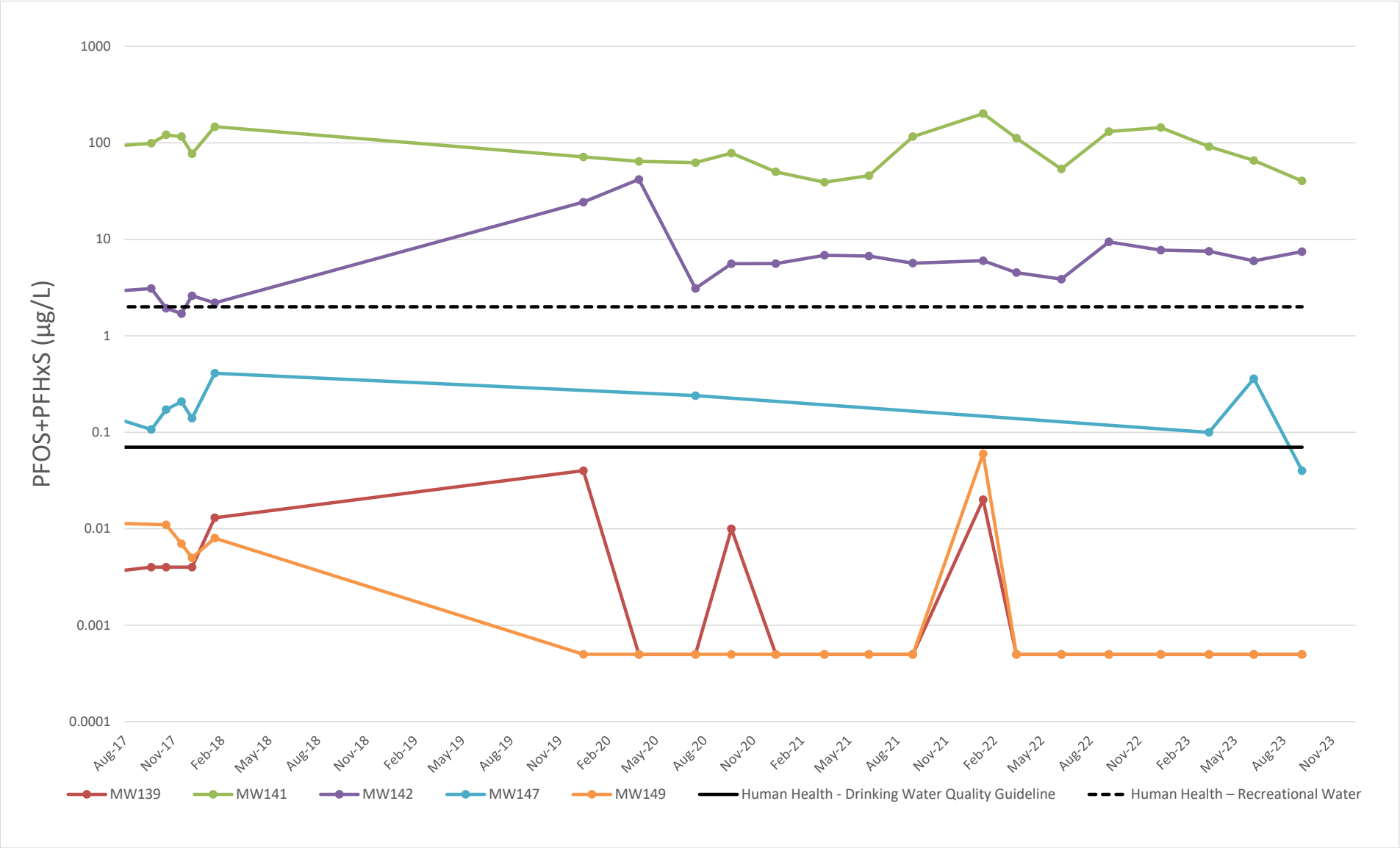
Table 7-4 Demolition ground PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min - Max	Dec-22	Mar-23	Jun-23	Sep-23
MW139	PFOS+PFHxS	<0.001 – 0.04	0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 – 0.16	<0.01	<0.01	<0.01	<0.01
MW141	PFOS+PFHxS	39.1 – 201	144.0	91.6	65.7	40.3
	PFOA	0.66 – 6.2	0.99	1.43	1.17	0.65
MW142	PFOS+PFHxS	1.7 – 41.8	7.72	7.52	5.98	7.46
	PFOA	0.02 – 3.04	0.33	0.29	0.24	0.33
MW147	PFOS+PFHxS	0.099 – 0.349	NS	0.10	0.36	0.04
	PFOA	<0.001 - 0.13	NS	<0.01	<0.01	<0.01
MW149	PFOS+PFHxS	<0.001 – 0.06	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - 0.001	<0.01	<0.01	<0.01	<0.01

New Maximum **New Minimum** **New Exceedance**

Note:
NS **-** Not Sampled

Figure 7-2 Demolition ground PFOS+PFHxS concentrations (µg/L)



Note: A logarithmic scale was used for the vertical axis

7.1.3.3 Wastewater Treatment Plant

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the WWTP monitoring locations is presented in Table 7-5 and plotted in Figure 7-3.

- The recreational criteria for PFOS+PFHxS was exceeded at MW161, MW166, MW171, MW172, MW173 and MW193. MW203 exceeded the drinking water criteria in December 2022. All other monitoring wells' PFOS+PFHxS results were either not recorded above the LOR or were below both assessment criteria.
- PFOA concentrations were detected above the LOR at MW161, MW166, MW171, MW172, MW173 and MW193 with only MW172 recording exceedances of the drinking water criteria.
- New PFOS+PFHxS concentration minimums were identified at MW161 (March and June 2023), MW193 (December 2022, June, and September 2023), and MW202 (March and September 2023).
- New PFOS+PFHxS concentration maximums were identified at MW171 (June 2023), MW172 (December 2022), MW196 (March 2023) and MW203 (December 2022). The new maximum at MW196 was one order of magnitude above historical range, however the following June 2023 result wasn't detected above the LOR.
- No new exceedance of the assessment criteria, or first-time detection of PFOA or PFOS+PFHxS, were identified at the WWTP monitoring wells during the monitoring period.

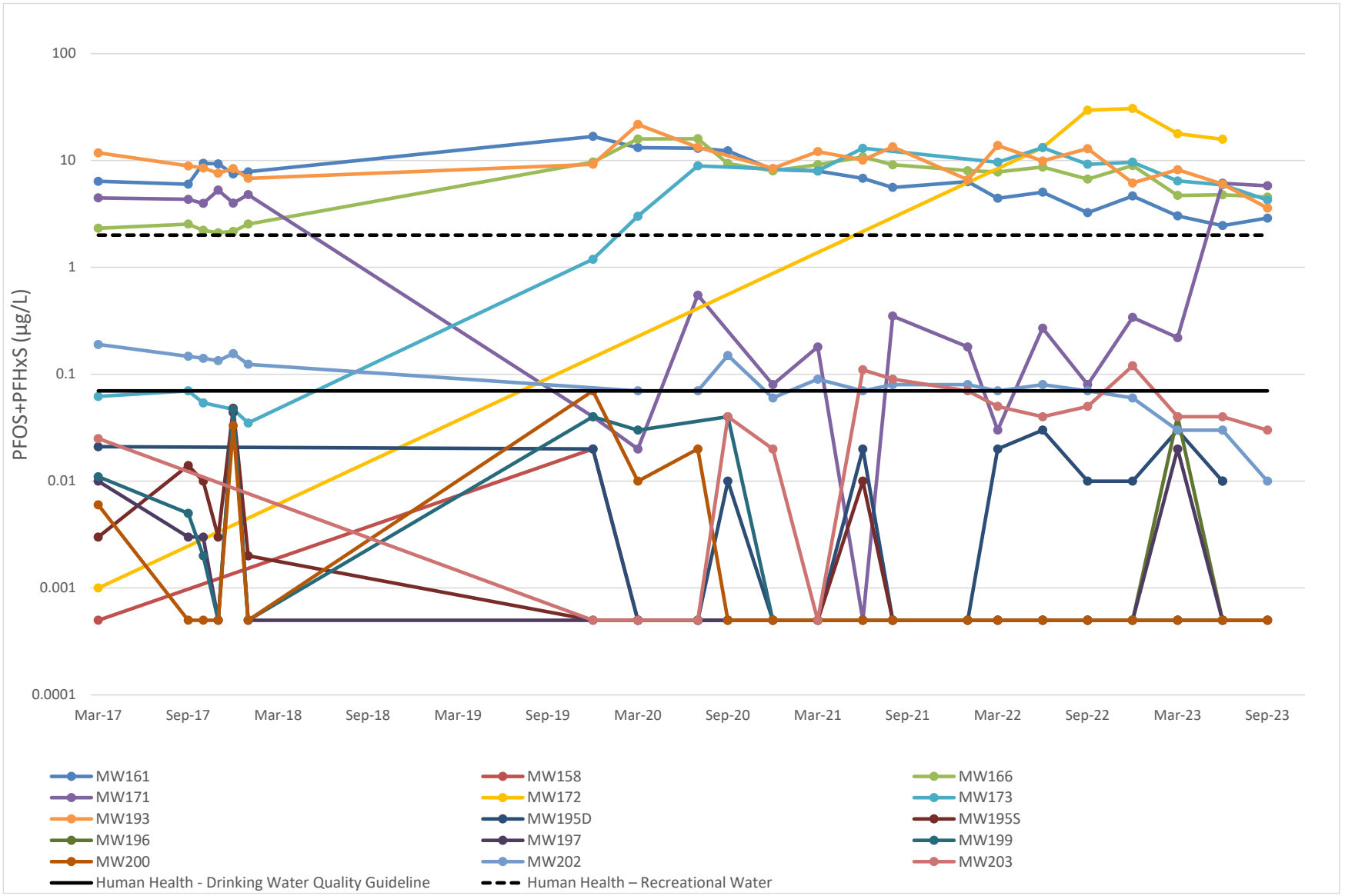
Table 7-5 WWTP PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical Range	October 2022 – September 2023 Monitoring Period			
		Min - Max	Dec-22	Mar-23	Jun-23	Sep-23
MW158	PFOS+PFHxS	<0.01 – 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW161	PFOS+PFHxS	3.25 – 16.8	4.65	3.03	2.46	2.89
	PFOA	0.02 – 0.23	0.02	0.02	0.01	0.03
MW166	PFOS+PFHxS	2.11 – 16.0	8.96	4.71	4.78	4.54
	PFOA	0.04 – 0.16	0.10	0.09	0.07	0.09
MW171	PFOS+PFHxS	<0.01 – 5.28	0.34	0.22	6.12	5.8
	PFOA	<0.01 – 0.26	<0.01	<0.01	0.30	0.25
MW172	PFOS+PFHxS	0.001 – 29.6	30.6	17.8	15.8	NS
	PFOA	<0.001– 0.66	0.75	0.48	0.60	NS
MW173	PFOS+PFHxS	0.035 – 13.0	9.64	6.44	5.92	4.27
	PFOA	0.008 – 1.10	0.34	0.23	0.22	0.15
MW193	PFOS+PFHxS	6.60 – 21.7	6.15	8.2	6.01	3.59
	PFOA	0.30 – 0.81	0.29	0.39	0.30	0.16
MW195D	PFOS+PFHxS	<0.01 - 0.03	0.01	0.03	0.01	<0.01
	PFOA	<0.01 - 0.006	<0.01	<0.01	<0.01	<0.01
MW195S	PFOS+PFHxS	0.002 – 0.048	<0.01	<0.01	<0.01	NS
	PFOA	<0.001 – 0.012	<0.01	<0.01	<0.01	NS
MW196	PFOS+PFHxS	<0.01 – 0.002	<0.01	0.04	<0.01	NS
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	NS
MW197	PFOS+PFHxS	<0.001 – 0.044	<0.01	0.02	<0.01	NS
	PFOA	<0.001 – 0.004	<0.01	<0.01	<0.01	NS
MW199	PFOS+PFHxS	<0.001 – 0.047	<0.01	<0.01	<0.01	NS
	PFOA	<0.001 – 0.002	<0.01	<0.01	<0.01	NS
MW200	PFOS+PFHxS	<0.001 - 0.07	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 – 0.001	<0.01	<0.01	<0.01	<0.01
MW202	PFOS+PFHxS	0.06 – 0.19	0.06	0.03	0.03	0.01
	PFOA	<0.001 – 0.002	<0.01	<0.01	<0.01	<0.01
MW203	PFOS+PFHxS	<0.01 - 0.11	0.12	0.04	0.04	0.03
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01

New Maximum **New Minimum** **New Exceedance**

Note:
NS – Not Sampled

Figure 7-3 WWTP PFOS+PFHxS concentrations (µg/L)



Note: A logarithmic scale was used for the vertical axis

7.1.3.4 Helicopter Support Facility

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the HSF monitoring locations is presented in Table 7-6 and plotted in Figure 7-4.

- The highest PFOS+PFHxS concentrations were recorded at MW282 (within the source area) whilst concentrations in MW226 and MW227 (shoreline to the northeast), MW214 (northwest) and MW225 (southeast) were not recorded above the LOR during the monitoring period. Exceedances of the recreational criteria for PFOS+PFHxS were reported during the first three quarterly monitoring events at MW216 and MW282, both within the source area and at MW220 (source area) during all events.
- PFOA concentrations were recorded above the LOR at MW216, MW217, MW220, MW228 and MM282. Only MW282 exceeded the recreational criteria and/or the drinking water criteria.
- A new PFOS+PFHxS concentration minimum was recorded at MW216 (1.86 µg/L) which was not an order of magnitude change.
- MW228 recorded new maximums in December 2022 (PFOA and PFOS+PFHxS), March 2023 (PFOA) and September 2023 (PFOS+PFHxS). All results were within the historical order of magnitude.
- No first-time detection of PFOS or PFOS+PFHxS, or new exceedance of the assessment criteria were identified at the HSF during the monitoring period.

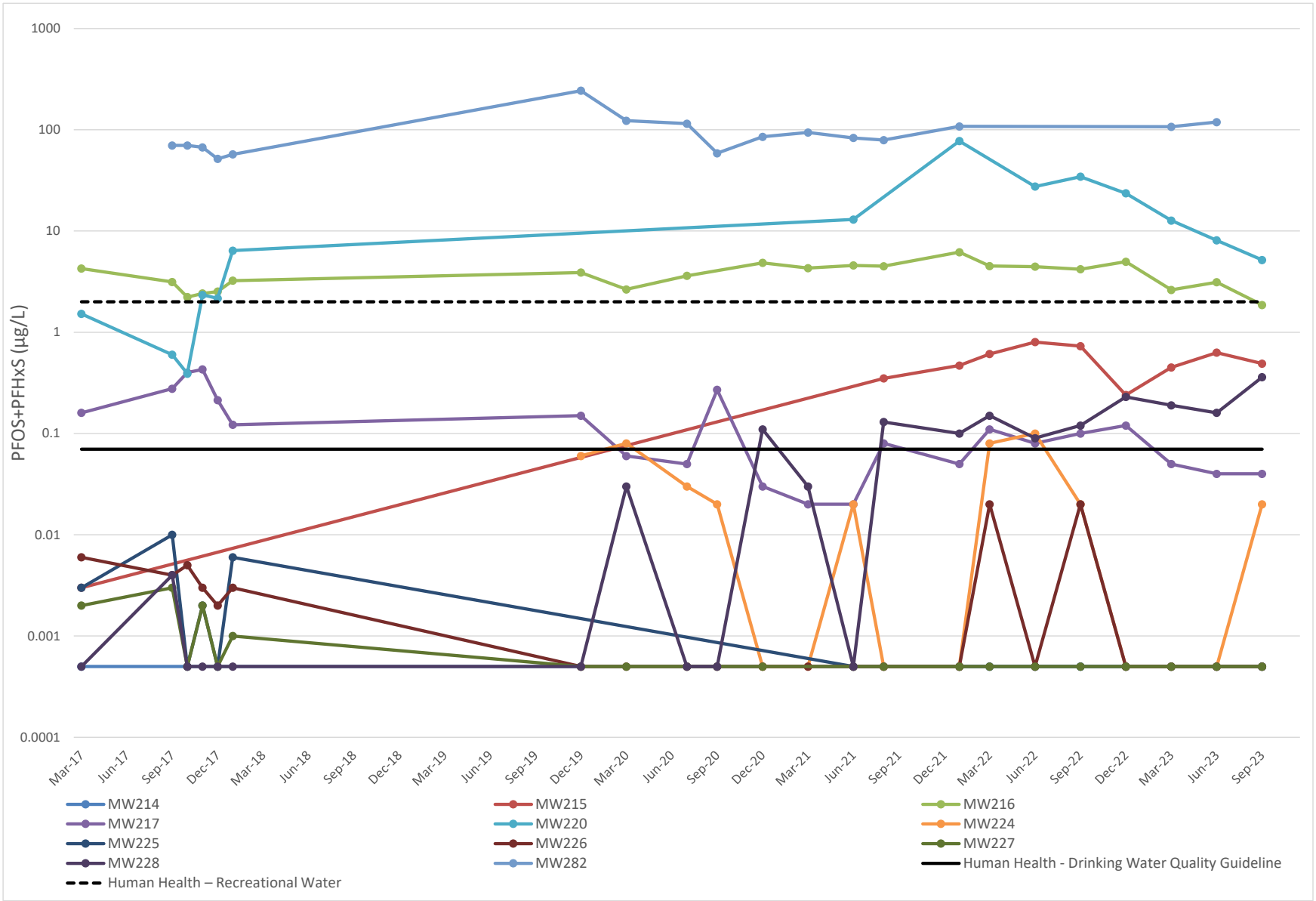
Table 7-6 HSF PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min - Max	Dec-22	Mar-23	Jun-23	Sep-23
MW214	PFOS+PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW215	PFOS+PFHxS	0.003 – 0.80	0.24	0.45	0.63	0.49
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW216	PFOS+PFHxS	2.228 – 6.18	4.98	2.62	3.12	1.86
	PFOA	0.072 - 0.41	0.32	0.17	0.24	0.16
MW217	PFOS+PFHxS	0.02 – 0.44	0.12	0.05	0.04	0.04
	PFOA	0.20 – 0.43	0.24	0.34	0.37	0.33
MW220	PFOS+PFHxS	0.39 – 77.4	23.6	12.7	8.09	5.18
	PFOA	0.014 – 0.64	0.16	0.10	0.14	0.05
MW224	PFOS+PFHxS	<0.01 – 0.10	<0.01	<0.01	<0.01	0.02
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW225	PFOS+PFHxS	<0.001 – 0.010	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW226	PFOS+PFHxS	<0.01 – 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	0.001 – <0.01	<0.01	<0.01	<0.01	<0.01
MW227	PFOS+PFHxS	<0.001 – 0.003	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW228	PFOS+PFHxS	<0.001 – 0.13	0.23	0.19	0.16	0.36
	PFOA	<0.001 – 0.10	0.19	0.23	0.14	0.16
MW282	PFOS+PFHxS	58.6 – 243.0	108	107	119	NS
	PFOA	4.10 – 13.01	11.8	8.27	6.35	NS

New Maximum **New Minimum** **New Exceedance**

Note:
NS – Not Sampled

Figure 7-4 HSF PFOS+PFHxS concentrations (µg/L)



Note: A logarithmic scale was used for the vertical axis

7.1.3.5 AVCAT storage, fuel farm and drainage swale

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the AVCAT storage, fuel farm and drainage swale monitoring locations is presented in Table 7-7 and plotted in Figure 7-5.

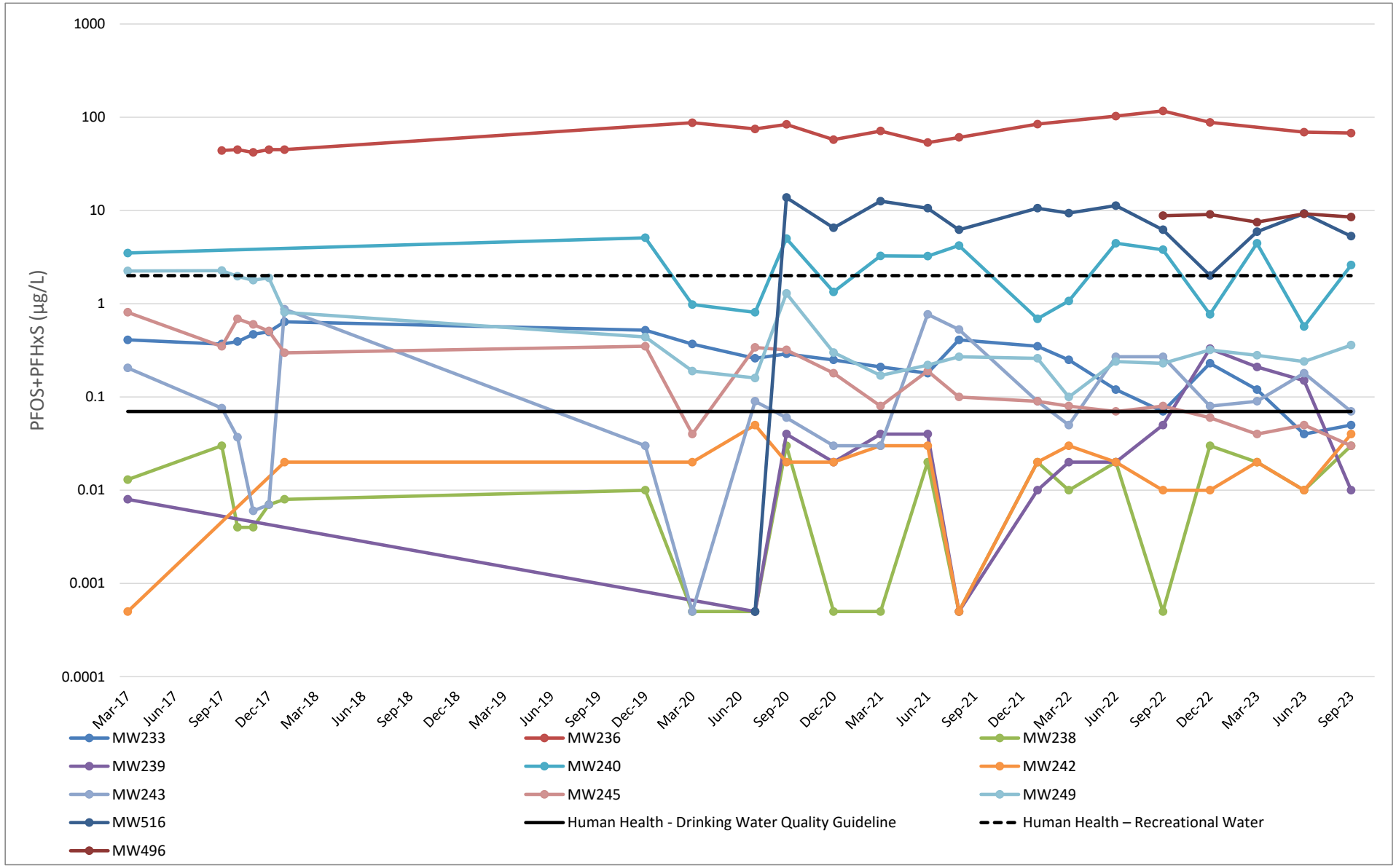
- PFOS+PFHxS concentrations at MW496 and MW516 (AVCAT storage) exceeded the recreational criteria during all the quarterly events of the monitoring period. Other exceedances of the recreational criteria at the AVCAT Storage were reported at MW240 (March and September 2023). MW236 (fuel farm) also exceeded the recreational criteria by one order of magnitude during all three events sampled (not sampled in March 2023).
- PFOA concentrations were recorded above the drinking water criteria but below the recreational criteria at MW236 (fuel farm). Other monitoring locations were either not recorded above the LOR or were below both assessment criteria.
- Concentrations of PFOS+PFHxS at MW233 (drainage swale) reported a new minimum during the June 2023 monitoring event. New PFOS+PFHxS concentrations minimums were recorded at the AVCAT Storage area in March 2023 (MW496), June 2023 (MW240) and September 2023 (MW245). All results were within historical orders of magnitude.
- New PFOS+PFHxS concentration maximums were reported at MW239 and MW496 (AVCAT storage source area) in the December 2022 monitoring event and again at MW496 in June 2023. The new maximum at MW239 was an order of magnitude change from historical range, other results were within historical orders of magnitude.
- No new exceedance or first-time detection of PFOS+PFHxS or PFOA were reported at the AVCAT storage, fuel farm and drainage swale monitoring locations during the monitoring period.

Table 7-7 AVCAT storage, fuel farm and drainage swale PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min - Max	Dec-22	Mar-23	Jun-23	Sep-23
Drainage Swale						
MW233	PFOS+PFHxS	0.07 – 0.64	0.23	0.12	0.04	0.05
	PFOA	0.005 – 0.04	<0.01	<0.01	<0.01	<0.01
Fuel Farm						
MW236	PFOS+PFHxS	42 – 117	88.2	NS	69.3	67.7
	PFOA	0.99 – 2.41	1.46	NS	1.99	1.45
AVCAT Storage						
MW238	PFOS+PFHxS	0.004 – 0.03	0.03	0.02	0.01	0.03
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW239	PFOS+PFHxS	<0.001 – 0.04	0.33	0.21	0.15	0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW240	PFOS+PFHxS	0.69 – 5.10	0.77	4.45	0.57	2.6
	PFOA	<0.01 – 0.30	0.06	0.19	0.01	0.08
MW242	PFOS+PFHxS	<0.001 – 0.05	0.01	0.02	0.01	0.04
	PFOA	<0.001 – <0.01	<0.01	<0.01	<0.01	<0.01
MW243	PFOS+PFHxS	0.006 – 0.874	0.08	0.09	0.18	0.07
	PFOA	<0.001 – 0.018	<0.01	<0.01	<0.01	<0.01
MW245	PFOS+PFHxS	0.04 – 0.81	0.06	0.04	0.05	0.03
	PFOA	<0.01 – 0.022	<0.01	<0.01	<0.01	<0.01
MW249	PFOS+PFHxS	0.10 – 2.27	0.32	0.28	0.24	0.36
	PFOA	<0.01 – 0.083	<0.01	<0.01	<0.01	<0.01
MW496	PFOS+PFHxS	8.80	9.08	7.49	9.22	8.51
	PFOA	0.16	0.10	0.09	0.10	0.10
MW516	PFOS+PFHxS	<0.01 – 14.5	2.01	5.92	9.29	5.31
	PFOA	<0.01 – 0.20	0.02	0.05	0.08	0.06

New Maximum **New Minimum** **New Exceedance**

Figure 7-5 AVCAT storage, fuel farm and drainage swale PFOS+PFHxS concentrations (µg/L)



Note: A logarithmic scale was used for the vertical axis

7.1.3.6 *Fire Station, Flammable/hazardous goods and waste storage, and Dredged Spoil*

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the fire station, flammable / hazardous goods and waste storage area, and dredged spoil monitoring locations is presented in Table 7-8 and plotted in Figure 7-6 and Figure 7-7.

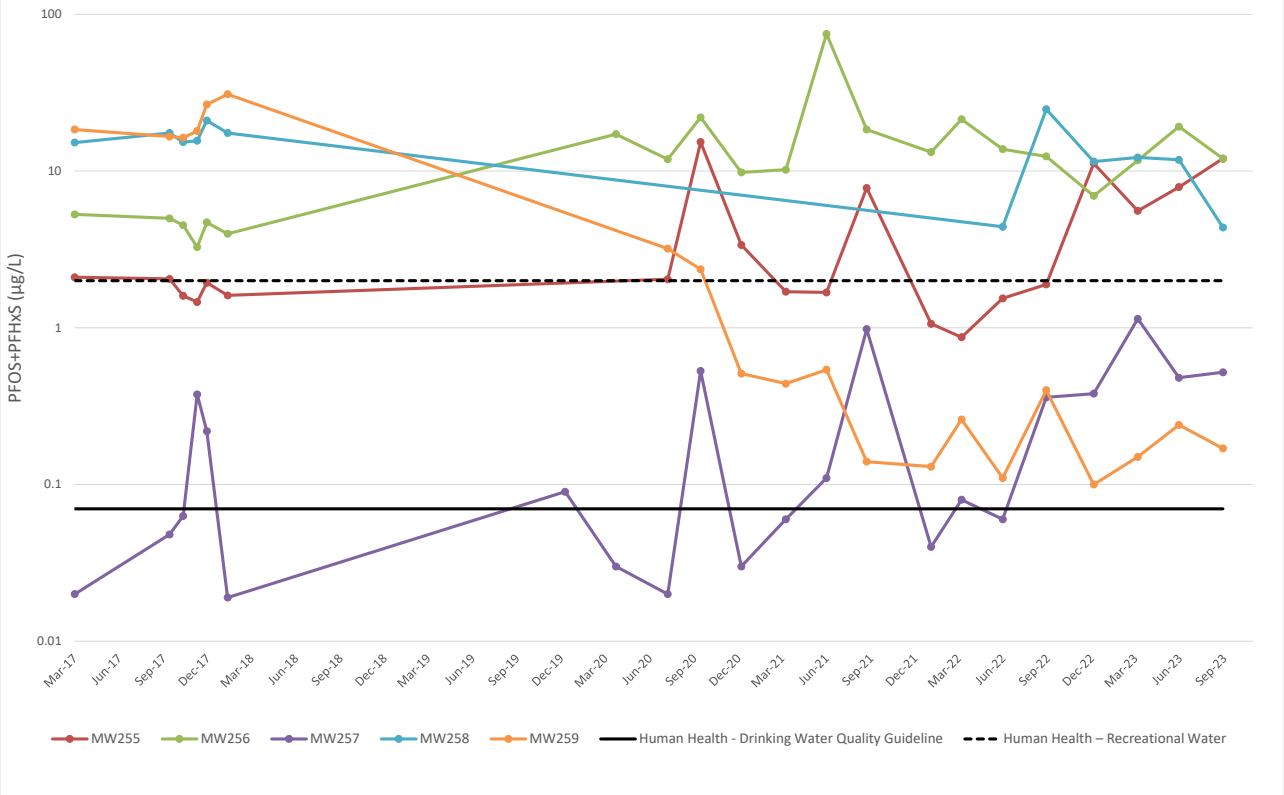
- PFOS+PFHxS concentrations exceeded the recreational criteria at MW255 and MW256 (fire station) and MW258 (flammable/hazardous goods and waste storage area). All other monitoring locations' PFOS+PFHxS results exceeded the drinking water criteria but were below the recreational criteria.
- PFOA concentrations were recorded above the LOR at MW255 and MW256 (fuel farm), MW257 and MW258 (flammable/hazardous goods and waste storage area), with one exceedance of the drinking water criteria recorded at MW256.
- New PFOS+PFHxS concentrations minimums were identified at MW258 and MW259 during the September 2023 and December 2022 monitoring events respectively. These remained within historical orders of magnitude.
- A new PFOS+PFHxS concentration maximum was identified at MW257 in March 2023, however, subsequent results returned to the historical range. The new maximum was within the same order of magnitude as historical maximum.
- No new exceedance or first-time detection were reported for PFOS+PFHxS or PFOA.

Table 7-8 Fire station, Flammable/hazardous goods and waste storage, and Dredged spoil PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min - Max	Dec-22	Mar-23	Jun-23	Sep-23
Fire Station						
MW255	PFOS+PFHxS	1.46 – 15.3	11.2	5.57	7.9	12.0
	PFOA	0.01 – 0.06	0.03	0.02	0.04	0.05
MW256	PFOS+PFHxS	3.98 – 75.0	6.95	11.7	19.2	12.0
	PFOA	0.093 – 2.45	0.18	0.36	0.67	0.31
Flammable / hazardous goods and waste storage area						
MW257	PFOS+PFHxS	0.019 – 0.98	0.38	1.14	0.48	0.52
	PFOA	<0.001 – 0.12	0.01	0.04	0.02	0.03
MW258	PFOS+PFHxS	4.41 – 24.8	11.5	12.2	11.8	4.37
	PFOA	0.06 – 0.58	0.34	0.50	0.34	0.18
MW259	PFOS+PFHxS	0.11 – 30.9	0.10	0.15	0.27	0.19
	PFOA	<0.01 – 0.56	<0.01	<0.01	<0.01	<0.01
Dredged spoil						
MW268	PFOS+PFHxS	0.20 – 0.80	0.34	0.32	0.30	0.32
	PFOA	<0.01 – 0.003	<0.01	<0.01	<0.01	<0.01
MW269	PFOS+PFHxS	0.262 – 1.56	0.29	0.67	0.65	0.62
	PFOA	0.002 – 0.01	<0.01	<0.01	<0.01	<0.01

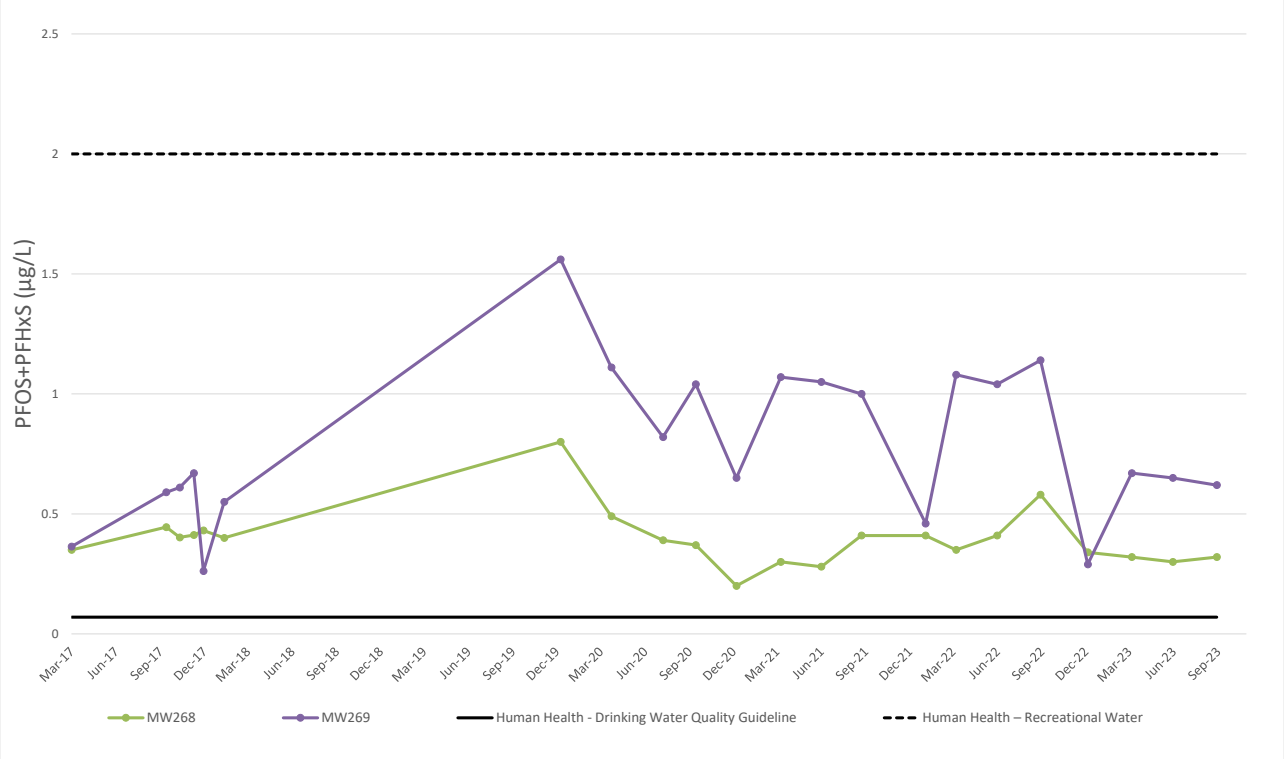
New Maximum **New Minimum** **New Exceedance**

Figure 7-6 Fire station and Flammable/ hazardous goods and waste storage area PFOS+PFHxS concentrations (µg/L)



Note: A logarithmic scale was used for the vertical axis

Figure 7-7 Dredged spoil PFOS+PFHxS concentrations (µg/L)



7.1.3.7 Accommodation Area

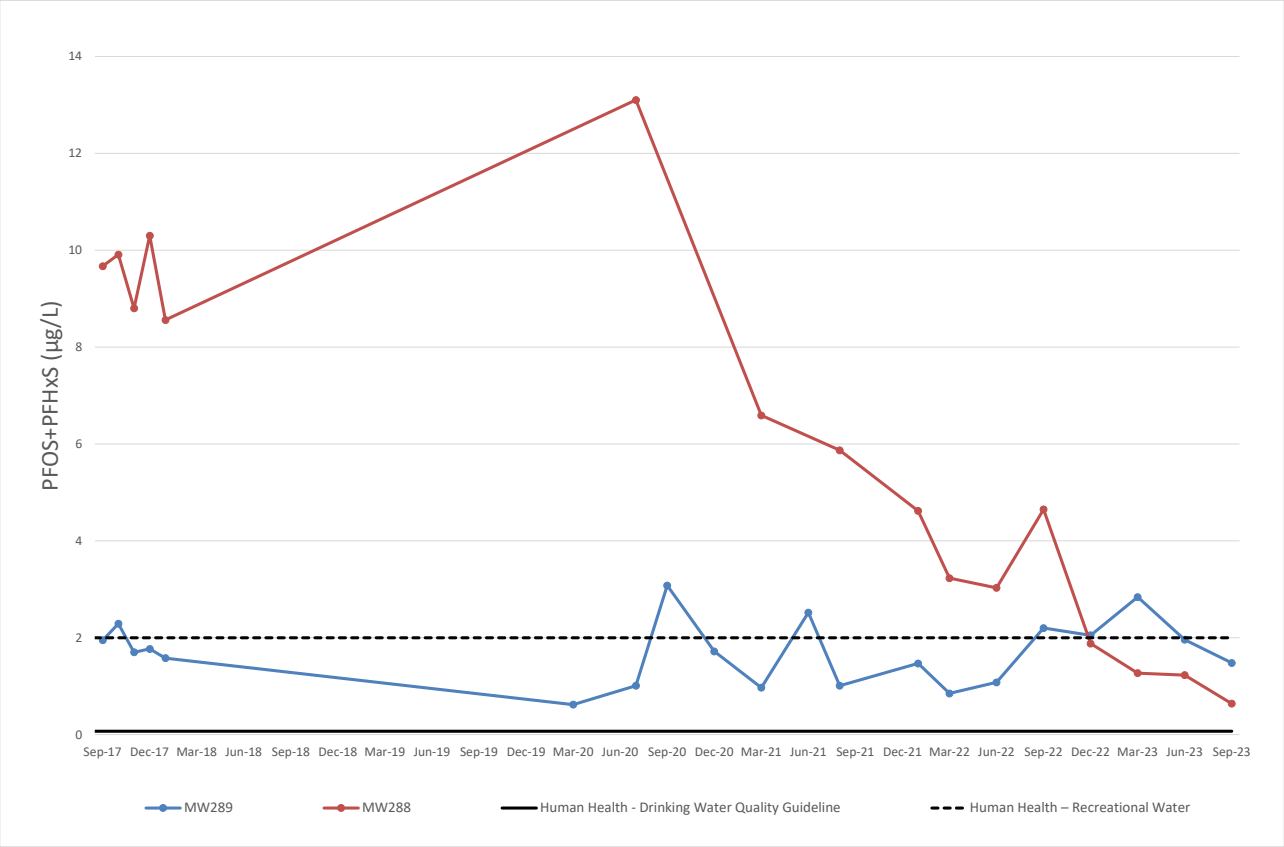
A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the accommodation area monitoring locations is presented in Table 7-9 and plotted in Figure 7-8.

- Both MW288 and MW289 reported PFOS+PFHxS results above the drinking water criteria. MW289 also exceeded the recreational criteria in December 2022 and March 2023.
- PFOA concentrations were not recorded above the LOR at MW288 and were recorded above the LOR but below both criteria at MW289.
- New minimum concentrations of PFOS+PFHxS were identified at MW288 during each event, although concentrations continued to exceed the drinking water criteria, they were below the recreational criteria for the first time since monitoring started. The results were within the historical order of magnitude.
- No new exceedance or first-time detection were reported for PFOS+PFHxS or PFOA.

Table 7-9 Accommodation area PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min - Max	Dec-22	Mar-23	Jun-23	Sep-23
MW288	PFOS+PFHxS	3.03 – 13.1	1.88	1.27	1.23	0.64
	PFOA	<0.01– 0.12	<0.01	<0.01	<0.01	<0.01
MW289	PFOS+PFHxS	0.62 – 3.08	2.05	2.84	1.96	1.48
	PFOA	0.006 – 0.05	0.03	0.05	0.02	0.02
New Maximum		New Minimum		New Exceedance		

Figure 7-8 Accommodation area PFOS+PFHxS concentrations (µg/L)



7.2 Porewater

7.2.1 Porewater Physicochemical Parameters

Porewater physicochemical parameters recorded during the four quarterly monitoring events of the monitoring period are summarised in Table 7-10 and provided within Table 6, Appendix D.

Table 7-10 Porewater Physicochemical Parameters

Parameter	December 2022	March 2023	June 2023	Sep 2023
DO	0.29 mg/L (PW341) – 8.82 mg/L (PW380) *Anaerobic to aerobic conditions.*	0.08 mg/L (PW340) – 9.95 mg/L (PW401) *Anaerobic to aerobic conditions.*	1.64 mg/L (PW340) – 6.51 mg/L (PW411) *Aerobic conditions.*	0.61 mg/L (PW335) – 6.83 mg/L (PW351) *Aerobic conditions.*
EC	16,802 µS/cm (PW304) – 67,797 µS/cm (PW405) *Saline conditions.*	25,742 µS/cm (PW378) – 69,257 µS/cm (PW369) *Saline conditions.*	19,386 µS/cm (PW409) – 54,879 µS/cm (PW374) *Saline conditions.*	28,015 µS/cm (PW363) – 55,199 µS/cm (PW357) *Saline conditions.*
pH	7.35 (PW367) – 8.15 (PW381) *Near neutral to slightly alkaline conditions.*	6.33 (PW368) – 8.12 (PW316) *Near neutral to slightly alkaline conditions.*	7.3 (PW367) – 8.07 (PW351) *Near neutral to slightly alkaline conditions.*	7.36 (PW331) – 8.24 (PW307) *Near neutral to slightly alkaline conditions.*
ORP*	-111.0 mV (PW363) – 249.6 mV (PW350) *Reducing to oxidising conditions.*	-170.8 mV (PW368) – 284.9 mV (PW411) *Reducing to oxidising conditions.*	129.0 mV (PW375) – 311.1 mV (PW367) *Oxidising conditions.*	-0.9 mV (PW335) – 351.6 mV (PW407) *Reducing to oxidising conditions.*

*ORP corrected from field reading (Eh+200mV)

No seasonal variation was observed in the porewater physicochemical parameters, and all parameters were consistent with those recorded during previous monitoring events.

7.2.2 Porewater Results Summary

A summary of the PFOA, PFOS and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the porewater monitoring locations are presented in the tables below. It is noted that the results are predominantly below LOR and therefore the concentration trends have not been plotted.

7.2.2.1 Fire Training Area

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the FTA monitoring locations is presented in Table 7-11.

- Concentrations of PFOS+PFHxS were recorded above the LOR at all locations, however, results were mostly below the assessment criteria. PW335 (March 2023) and PW340 (December 2022) were the only exceedances of the drinking water criteria during the monitoring period.
- Concentrations of PFOS exceeded the ecological protection criteria of 0.00023 µg/L (LOR adopted, refer to Table 5-1 footnote) at all locations during March 2023, at some locations in December and June 2023 and no exceedances were reported in September 2023.
- PFOA concentrations were not recorded above the LOR at any location during the monitoring period.
- A new maximum concentration of PFOS and PFOS+PFHxS was identified at PW335 in March 2023 (0.14 µg/L). This is a new exceedance of the drinking water criteria for PFOS+PFHxS. Subsequent events (June and September 2023) did not record concentrations above the LOR at this location.
- No new exceedance or first-time detection of PFOA were reported in porewater samples at the FTA.

Table 7-11 FTA porewater PFOS+PFHxS, PFOS, and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
PW335	PFOS + PFHxS	0.004 – 0.07	0.02	0.14	<0.01	<0.01
	PFOS	0.003 – 0.07	0.02	0.14	<0.01	<0.01
	PFOA	<0.001 – 0.001	<0.01	<0.01	<0.01	<0.01
PW340	PFOS + PFHxS	0.004 – 0.28	0.09	0.04	0.03	<0.01
	PFOS	0.003 – 0.28	0.03	0.04	0.03	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW341	PFOS + PFHxS	0.008 – 0.04	0.02	0.01	0.02	<0.01
	PFOS	0.004 – 0.04	0.02	0.01	0.02	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW362	PFOS + PFHxS	<0.01 - 0.23	0.01	0.03	<0.01	<0.01
	PFOS	0.009 – 0.23	0.01	0.03	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW363	PFOS + PFHxS	0.006 – 0.06	<0.01	0.01	0.01	<0.01
	PFOS	0.002 – 0.06	<0.01	0.01	0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW364	PFOS + PFHxS	<0.01 - 0.05	0.04	0.02	0.02	<0.01
	PFOS	<0.01 - 0.05	0.04	0.02	0.02	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01

New Maximum **New Minimum** **New Exceedance**

7.2.2.2 Demolition Ground

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the demolition ground monitoring locations is presented in Table 7-12.

- The majority of results at the demolition ground porewater locations were below the LOR for PFOS, PFOS+PFHxS and PFOA for all events of the monitoring period.
- No results outside of historical ranges were reported in porewater at the demolition ground.

Table 7-12 Demolition ground porewater PFOS+PFHxS, PFOS, and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
PW329	PFOS + PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW330	PFOS + PFHxS	0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW331	PFOS + PFHxS	0.001 – 0.01	<0.01	<0.01	<0.01	0.01
	PFOS	0.001 – 0.01	<0.01	<0.01	<0.01	0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW356	PFOS + PFHxS	0.002 - 0.10	0.02	<0.01	<0.01	<0.01
	PFOS	0.002 - 0.08	0.02	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW357	PFOS + PFHxS	0.002 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	0.002 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW358	PFOS + PFHxS	0.001 – 0.02	<0.01	<0.01	0.01	<0.01
	PFOS	0.001 – 0.02	<0.01	<0.01	0.01	<0.01
	PFOA	<0.01 – 0.001	<0.01	<0.01	<0.01	<0.01

New Maximum | **New Minimum** | **New Exceedance**

7.2.2.3 Wastewater Treatment Plant

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the WWTP monitoring locations is presented in Table 7-13.

- The drinking water criteria for PFOS+PFHxS was exceeded at PW304, PW368 and PW380 during at least one event of the monitoring period.
- The ecological protection criteria for PFOS was exceeded at all locations during at least one event of the monitoring period.
- PFOA concentrations were not recorded above the LOR at any location during the monitoring period.
- PW351 reported a new PFOS concentration maximum in March 2023 (0.02 µg/L).
- No new exceedance or first-time detection of PFOA or PFOS+PFHxS were reported in porewater samples at the WWTP.

Table 7-13 WWTP porewater PFOS+PFHxS, PFOS, and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 - September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
			West shore			
PW350	PFOS + PFHxS	<0.01 - 4.44	<0.01	0.02	<0.01	<0.01
	PFOS	<0.01 – 0.14	<0.01	0.02	<0.01	<0.01
	PFOA	<0.01 - 0.27	<0.01	<0.01	<0.01	<0.01
PW351	PFOS + PFHxS	<0.01 - 0.216	<0.01	0.02	<0.01	<0.01
	PFOS	<0.01 - 0.01	<0.01	0.02	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW352	PFOS + PFHxS	<0.01 - 0.034	<0.01	0.01	<0.01	<0.01
	PFOS	<0.01 - 0.03	<0.01	0.01	<0.01	<0.01
	PFOA	<0.001 -<0.01	<0.01	<0.01	<0.01	<0.01
PW380	PFOS + PFHxS	<0.01 - 0.868	0.09	<0.01	<0.01	<0.01
	PFOS	0.008 – 0.08	0.06	<0.01	<0.01	<0.01
	PFOA	0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW381	PFOS + PFHxS	<0.01 - 1.406	0.02	<0.01	<0.01	<0.01
	PFOS	0.006 – 0.05	0.02	<0.01	<0.01	<0.01
	PFOA	<0.01 - 0.004	<0.01	<0.01	<0.01	<0.01
PW401	PFOS + PFHxS	<0.01 - 3.64	0.07	<0.01	0.01	<0.01
	PFOS	<0.01 – 0.05	0.05	<0.01	0.01	<0.01
	PFOA	<0.01 - 0.032	<0.01	<0.01	<0.01	<0.01
			East shore			
PW304	PFOS + PFHxS	<0.01 – 0.09	0.02	0.08	<0.01	0.02
	PFOS	<0.01 – 0.09	0.02	0.07	<0.01	0.02
	PFOA	0.003 - <0.01	<0.01	<0.01	<0.01	<0.01
PW345	PFOS + PFHxS	<0.01 - 0.50	0.07	0.04	0.02	0.05
	PFOS	<0.01 - 0.47	0.07	0.04	0.02	0.05
	PFOA	<0.001 -<0.01	<0.01	<0.01	<0.01	<0.01
PW367	PFOS + PFHxS	<0.01 - 0.30	0.02	0.02	0.04	0.02
	PFOS	<0.01 - 0.27	0.02	0.02	0.04	0.02
	PFOA	<0.01 - 0.003	<0.01	<0.01	<0.01	<0.01
PW368	PFOS + PFHxS	<0.01 - 0.33	0.28	0.04	0.15	0.06
	PFOS	<0.01 - 0.27	0.27	0.04	0.15	0.06
	PFOA	0.009 - <0.01	<0.01	<0.01	<0.01	<0.01
PW369	PFOS + PFHxS	<0.01 - 0.69	0.03	0.07	0.02	0.02
	PFOS	<0.01 - 0.60	0.03	0.07	0.02	0.02
	PFOA	<0.001 - 0.08	<0.01	<0.01	<0.01	<0.01

New Maximum **New Minimum** **New Exceedance**

7.2.2.4 Helicopter Support Facility

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the HSF monitoring locations is presented in Table 7-14.

- Concentrations of PFOS+PFHxS, PFOA and PFOS were not reported above the LOR for any sample, with the exception of PW405 during March 2023 and PW415 in December 2022 but concentrations returned to below the LOR in following events.
- There were no new minimums or maximums recorded as all concentrations were within historical range.

Table 7-14 HSF porewater PFOS+PFHxS, PFOS, and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
PW306	PFOS + PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW307	PFOS + PFHxS	0.001- <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	0.001- <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001- <0.01	<0.01	<0.01	<0.01	<0.01
PW308	PFOS + PFHxS	0.002 – 0.03	<0.01	<0.01	<0.01	<0.01
	PFOS	0.002 – 0.03	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001- <0.01	<0.01	<0.01	<0.01	<0.01
PW314	PFOS + PFHxS	<0.001- <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.001- <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001- <0.01	<0.01	<0.01	<0.01	<0.01
PW315	PFOS + PFHxS	0.001 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	0.001 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001- <0.01	<0.01	<0.01	<0.01	<0.01
PW316	PFOS + PFHxS	0.001 – 0.1	<0.01	<0.01	<0.01	<0.01
	PFOS	0.001 – 0.1	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001- <0.01	<0.01	<0.01	<0.01	<0.01
PW405	PFOS + PFHxS	<0.01 – 0.01	<0.01	0.01	<0.01	<0.01
	PFOS	<0.01 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
PW407	PFOS + PFHxS	<0.01 - 0.02	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.01 - 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
PW409	PFOS + PFHxS	<0.01 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.01 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
PW411	PFOS + PFHxS	<0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
PW413	PFOS + PFHxS	<0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.01	<0.01	<0.01	<0.01	<0.01

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
PW415	PFOS + PFHxS	<0.01 – 0.02	0.01	<0.01	<0.01	<0.01
	PFOS	<0.01 – 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
New Maximum		New Minimum			New Exceedance	

7.2.2.5 *Accommodation Area*

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the accommodation area monitoring location (PW346) is presented in Table 7-15.

- PFOS+PFHxS concentrations at PW346 exceeded the recreational criteria in December 2022. The following three monitoring events reported concentrations below the recreational criteria and above the drinking water criteria at this location.
- PFOS exceeded the ecological protection criteria at PW346 during all events of the monitoring period.
- PFOA was only recorded above the LOR in December 2022 but was below the assessment criteria.
- A new maximum concentration of PFOS and PFOS+PFHxS was recorded at PW346 in December 2022 however the increase was less than one order of magnitude from previous maximum.

Table 7-15 Accommodation Area porewater PFOS+PFHxS, PFOS, and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
PW346	PFOS + PFHxS	0.01 – 5.62	7.52	0.43	0.59	0.26
	PFOS	0.01 – 4.97	7.1	0.41	0.55	0.24
	PFOA	<0.01 – 0.06	0.06	<0.01	<0.01	<0.01
New Maximum		New Minimum			New Exceedance	

7.2.2.6 *Dredge Spoil and Careening Bay*

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the dredge spoil and careening bay monitoring locations is presented in Table 7-16.

- PFOS+PFHxS concentrations were recorded above the LOR at all locations with exceedances of the drinking water criteria identified at PW374 and PW375 in June 2023.
- Each location reported exceedances of the ecological protection criteria for PFOS during two events the monitoring period.
- PFOA concentrations were not recorded above the LOR at any location during the monitoring period.
- PW375 recorded a new maximum for PFOS and PFOS+PFHxS in June 2023. The concentrations were within the same orders of magnitude as historical maximums The September 2023 concentrations at PW375 were not detected above the LOR.

Table 7-16 Dredge spoil and careening bay porewater PFOS+PFHxS, PFOS, and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
PW374	PFOS + PFHxS	<0.01 – 0.44	<0.01	<0.01	0.12	0.02
	PFOS	0.007 – 0.44	<0.01	<0.01	0.12	0.02
	PFOA	<0.001 - 0.01	<0.01	<0.01	<0.01	<0.01
PW375	PFOS + PFHxS	<0.01 – 0.09	<0.01	0.02	0.65	<0.01
	PFOS	0.003 – 0.09	<0.01	0.02	0.65	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW378	PFOS + PFHxS	<0.01 – 0.12	<0.01	0.06	0.02	<0.01
	PFOS	0.007 – 0.12	<0.01	0.06	0.02	<0.01
	PFOA	0.005 - <0.01	<0.01	<0.01	<0.01	<0.01

New Maximum **New Minimum** **New Exceedance**

7.3 Surface Water

7.3.1 Surface Water Physicochemical Parameters

Surface water Physicochemical parameters recorded during the four quarterly monitoring events of the monitoring period are summarised in Table 7-17 and provided within Table 7, Appendix D.

Table 7-17 Surface water Physicochemical Parameters

Parameter	December 2022	March 2023	June 2023	September 2023
DO	3.07 mg/L (SW305) – 6.80 mg/L (SW373) *Aerobic conditions*	1.36 mg/L (SW370) – 5.90 mg/L (SW414) *Aerobic conditions*	1.23 mg/L (SW134) – 6.03 mg/L (SW130) *Aerobic conditions*	3.02 mg/L (SW150) – 6.95 mg/L (SW305) *Aerobic conditions*
EC	50,051 µS/cm (SW410) – 67,905 µS/cm (SW370) *Saline conditions*	50,461 µS/cm (SW150) – 60,356 µS/cm (SW130) *Saline conditions*	28,234 µS/cm (SW134) – 68,610 µS/cm (SW156) *Saline conditions*	26,832 µS/cm (SW409) – 54,270 µS/cm (SW150) *Saline conditions*
pH	7.8 (SW305) – 8.26 (SW406) *Slightly alkaline conditions*	6.90 (SW150) – 8.27 (SW414) *Near neutral to slightly alkaline conditions*	7.92 (SW408) – 8.14 (SW317) *Slightly alkaline conditions*	7.65 (SW154) – 8.21 (SW412) *Slightly alkaline conditions*
ORP	-24.9 mV (SW134) – 282.9 mV (SW406) *Reducing to oxidising conditions*	-62.5 mV (SW371) – 295.8 mV (SW150) *Reducing to oxidising conditions*	39.4 mV (SW134) – 290.7 mV (SW370) *Oxidising conditions*	63.6 mV (SW134) – 351.0 mV (SW408) *Oxidising conditions*

Surface water physicochemical parameters were consistent with previous monitoring events and did not display seasonal variation.

7.3.2 Surface Water Results Summary

7.3.2.1 Fire Training Area

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the FTA monitoring locations is presented in Table 7-18.

- PFOS+PFHxS were either not recorded above the LOR or were below the assessment criteria.
- PFOS concentrations exceeded the ecological protection criteria at all locations in December 2022 and at SW130 in March 2023. No other sample recorded PFOS above the LOR during the monitoring period.
- PFOA concentrations were not recorded above the LOR at any FTA location during the monitoring period.

> No new exceedance of the assessment criteria or first-time detection of PFOA or PFOS+PFHxS were reported in surface water at the FTA during the monitoring period.

Table 7-18 FTA surface water PFOS + PFHxS, PFOS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
SW130	PFOS + PFHxS	<0.01 – 0.05	0.03	0.02	<0.01	<0.01
	PFOS	<0.01 – 0.05	0.03	0.02	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
SW132	PFOS + PFHxS	<0.01 – 0.07	0.02	<0.01	<0.01	<0.01
	PFOS	<0.01 – 0.07	0.02	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
SW134	PFOS + PFHxS	<0.01 – 0.031	0.02	<0.01	<0.01	<0.01
	PFOS	<0.01 – 0.027	0.02	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
New Maximum		New Minimum			New Exceedance	

7.3.2.2 Demolition Ground

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the demolition ground monitoring locations is presented in Table 7-19.

> PFOS+PFHxS were either not recorded above the LOR or were below the assessment criteria.

> An exceedance of the ecological protection criteria for PFOS was identified at SW150 in September 2023.

> PFOA concentrations were not recorded above the LOR at any location during the monitoring period which is consistent with historical results.

> A new PFOS and PFOS+PFHxS concentration maximum was recorded at SW150 in September 2023 and was within the same order of magnitude as the LOR.

> No new exceedance of the assessment criteria or first-time detection of PFOA or PFOS+PFHxS were reported in surface water at the demolition ground during the monitoring period.

Table 7-19 Demolition ground surface water PFOS+PFHxS , PFOS, and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 - September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
SW150	PFOS + PFHxS	0.001 - <0.01	<0.01	<0.01	<0.01	0.01
	PFOS	0.001 - <0.01	<0.01	<0.01	<0.01	0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW152	PFOS + PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW154	PFOS + PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW156	PFOS + PFHxS	<0.001 - 0.02	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.001 - 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01

New Maximum **New Minimum** **New Exceedance**

7.3.2.3 Wastewater Treatment Plant

Surface water locations are monitored on the east and west shores of Garden Island, on both sides of the WWTP.

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the WWTP monitoring locations is presented in Table 7-20.

- PFOS+PFHxS concentrations were not detected above the LOR at west shore locations. Exceedances of the drinking water criteria were identified on the east shore at SW371, SW372 and SW373.
- Exceedances of the ecological protection criteria for PFOS were identified on the east shore (SW370, SW371, SW305, SW372, SW373).
- Concentrations of PFOA were consistently not reported above the LOR at any locations.
- SW372 reported a new maximum concentration of PFOS and PFOS+PFHxS in December 2022, subsequent results were within the historical range. The new maximum was within the same order of magnitude as historical maximum.
- No new exceedance of the assessment criteria or first-time detection of PFOA or PFOS+PFHxS were reported in surface water around the WWTP during the monitoring period.

Table 7-20 WWTP surface water PFOS+PFHxS , PFOS, and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
			West Shore			
SW353	PFOS+PFHxS	<0.001 - 0.52	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.001 - 0.52	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - 0.01	<0.01	<0.01	<0.01	<0.01
SW382	PFOS+PFHxS	<0.001 - 0.17	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.001 - 0.17	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW383	PFOS+PFHxS	0.001 - 0.02	<0.01	<0.01	NA	<0.01
	PFOS	0.001 - 0.02	<0.01	<0.01	NA	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	NA	<0.01
SW384	PFOS+PFHxS	<0.001 - 0.02	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.001 - 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
			East shore			
SW370	PFOS+PFHxS	<0.01 - 0.13	0.02	0.03	<0.01	<0.01
	PFOS	0.008 - 0.11	0.02	0.03	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW371	PFOS+PFHxS	<0.01 - 0.31	0.07	0.07	0.06	<0.01
	PFOS	0.009 - 0.31	0.07	0.07	0.06	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
			East shore (cross-gradient)			
SW305	PFOS+PFHxS	<0.01 - 0.40	0.04	0.01	0.03	<0.01
	PFOS	0.008 – 0.37	0.04	0.01	0.03	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW372	PFOS+PFHxS	<0.01 - 0.11	0.68	0.04	0.08	0.10
	PFOS	<0.01 - 0.09	0.60	0.04	0.08	0.06
	PFOA	0.002 - <0.01	<0.01	<0.01	<0.01	<0.01
SW373	PFOS+PFHxS	<0.01 - 0.56	0.26	0.16	0.30	0.21
	PFOS	<0.01 - 0.44	0.22	0.14	0.28	0.20
	PFOA	0.001 - 0.01	<0.01	<0.01	<0.01	<0.01

New Maximum **New Minimum** **New Exceedance**

Note: NA – Not Analysed

7.3.2.4 *Helicopter Support Facility*

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the HSF monitoring locations is presented in Table 7-21.

> No concentrations of PFOS, PFOS+PFHxS or PFOA were recorded above the LOR at any of the surface water monitoring locations around the HSF during the monitoring period.

Table 7-21 HSF surface water PFOS and PFHxS, PFOS, and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
SW309	PFOS+PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW310	PFOS+PFHxS	0.004 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	0.004 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW311	PFOS+PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW406	PFOS+PFHxS	<0.01 – 0.02	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.01 – 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01 - <0.01	<0.01	<0.01	<0.01	<0.01
SW408	PFOS+PFHxS	<0.01 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.01 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01 - <0.01	<0.01	<0.01	<0.01	<0.01
SW410	PFOS+PFHxS	<0.01 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.01 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01 - <0.01	<0.01	<0.01	<0.01	<0.01
SW412	PFOS+PFHxS	<0.01 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.01 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01 - <0.01	<0.01	<0.01	<0.01	<0.01
SW414	PFOS+PFHxS	<0.01 – 0.04	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.01 – 0.04	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01 - <0.01	<0.01	<0.01	<0.01	<0.01
SW416	PFOS+PFHxS	<0.01 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.01 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01 - <0.01	<0.01	<0.01	<0.01	<0.01

New Maximum **New Minimum** **New Exceedance**

7.3.2.5 *Dredged spoil and careening bay*

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the dredged spoil and careening bay monitoring locations is presented in Table 7-22.

> No concentrations of PFOS, PFOS+PFHxS or PFOA were recorded above the LOR at any of the surface water monitoring locations downgradient of the dredged spoil at Careening Bay during the monitoring period.

Table 7-22 Dredge spoil and Careening Bay surface water PFOS and PFHxS, PFOS, and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
SW317	PFOS+PFHxS	0.008 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOS	0.007 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW318	PFOS+PFHxS	0.001 - 0.02	<0.01	<0.01	<0.01	<0.01
	PFOS	0.001 - 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW319	PFOS+PFHxS	<0.001 – 0.13	<0.01	<0.01	<0.01	<0.01
	PFOS	<0.001 – 0.10	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
New Maximum		**New Minimum**		**New Exceedance**		

7.4 Sediment

7.4.1 Sediment Field Observations

Sediment observations recorded during the four quarterly monitoring events are provided within Table 8, Appendix D.

Sediment samples were generally described as wet grey/yellow coarse sand.

7.4.2 Sediment Results Summary

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the sediment sampling locations are presented in the tables below. It is noted that the results are predominantly below LOR and therefore the results have not been plotted.

7.4.2.1 Fire Training Area

A summary of the PFOA, PFOS and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the FTA monitoring locations is presented in Table 7-23.

- Concentrations of PFOS and PFOS+PFHxS were reported above the LOR at SD335 and SD364 in December 2022, SD340 in March and June 2023, SD362 and SD363 in March 2023. Results were of the same order of magnitude as the LOR.
- No location reported a concentration of PFOA above the LOR during the monitoring period.
- A new concentration maximum was identified at SD340 in March 2023. This was confirmed during June 2023 but was not an order of magnitude change.
- No first-time detection of PFOS+PFHxS or PFOA was identified during the monitoring period.

Table 7-23 FTA sediment PFOS+PFHxS, PFOS and PFOA concentrations (mg/kg)

Location ID	Analyte	Historical range	October 2022 - September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
SD335	PFOS+PFHxS	<0.0002 – 0.0005	0.0003	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002 – 0.0005	0.0003	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD340	PFOS+PFHxS	<0.0002 – 0.0002	<0.0002	0.0003	0.0003	<0.0002
	PFOS	<0.0002 – 0.0002	<0.0002	0.0003	0.0003	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD341	PFOS+PFHxS	<0.0002 – 0.0004	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002 – 0.0004	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD362	PFOS+PFHxS	<0.0002 – 0.0003	<0.0002	0.0002	<0.0002	<0.0002
	PFOS	<0.0002 – 0.0003	<0.0002	0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD363	PFOS+PFHxS	<0.0002 – 0.0005	<0.0002	0.0002	<0.0002	<0.0002
	PFOS	<0.0002 – 0.0005	<0.0002	0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD364	PFOS+PFHxS	<0.0002 – 0.0006	0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002 – 0.0006	0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
		New Minimum		New Maximum		

7.4.2.2 Demolition Ground

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the demolition ground monitoring locations is presented in Table 7-24.

> None of the demolition ground sediment monitoring location reported results above the LOR for either PFOA, PFOS or PFOS+PFHxS during the monitoring period.

Table 7-24 Demolition ground sediment PFOS+PFHxS, PFOS and PFOA concentrations (mg/kg)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
SD329	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD330	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD331	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD356	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD357	PFOS+PFHxS	0.0001 - <0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	0.0001 - <0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD358	PFOS+PFHxS	<0.0002 – 0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002 – 0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
		New Minimum			**New Maximum**	

7.4.2.3 Wastewater Treatment Plant

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the WWTP monitoring locations is presented in Table 7-25.

> PFOS and PFOS+PFHxS concentrations were reported above the LOR at SD304, SD345, SD350, SD367, SD368, SD369, SD380 and SD401. Results were of the same order of magnitude as the LOR.

> No location reported a concentration of PFOA above the LOR during the monitoring period.

> A new concentration maximum of PFOS and PFOS+PFHxS was identified at SD401 during December 2022 (0.0015 mg/kg).

> No first-time detection of PFOS+PFHxS or PFOA was identified during the monitoring period.

Table 7-25 WWTP sediment PFOS+PFHxS, PFOS, and PFOA concentrations (mg/kg)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
			West shore			
SD350	PFOS+PFHxS	<0.0002 – 0.0006	0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002 – 0.0006	0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD351	PFOS+PFHxS	<0.0002– 0.0003	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002– 0.0003	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD352	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD380	PFOS+PFHxS	<0.0002 – 0.0003	0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002 – 0.0003	0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD381	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD401	PFOS+PFHxS	<0.0002 – 0.0004	0.0015	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002 – 0.0004	0.0015	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
			East shore			
SD304	PFOS+PFHxS	<0.0002 – 0.0006	<0.0002	0.0004	<0.0002	<0.0002
	PFOS	<0.0002 – 0.0006	<0.0002	0.0004	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD345	PFOS+PFHxS	<0.0002 – 0.0017	0.0003	<0.0002	0.0004	0.0002
	PFOS	<0.0002 – 0.0017	0.0003	<0.0002	0.0004	0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD367	PFOS+PFHxS	<0.0002– 0.0011	0.0004	0.0007	0.0008	<0.0002
	PFOS	<0.0002– 0.0011	0.0004	0.0007	0.0008	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD368	PFOS+PFHxS	<0.0002 – 0.0010	0.0009	0.0003	0.0003	0.0003
	PFOS	<0.0002 – 0.0010	0.0009	0.0003	0.0003	0.0003
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD369	PFOS+PFHxS	<0.0002 – 0.0021	<0.0002	0.0003	<0.0002	<0.0002
	PFOS	<0.0002 – 0.0021	<0.0002	0.0003	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
		New Minimum			**New Maximum**	

7.4.2.4 Helicopter Support Facility

A summary of the PFOA, PFOS and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the HSF monitoring locations is presented in Table 7-26.

> None of the HSF sediment monitoring location reported results above the LOR for either PFOA, PFOS or PFOS+PFHxS during the monitoring period.

Table 7-26 HSF sediment PFOS+PFHxS, PFOS and PFOA concentrations (mg/kg)

Location ID	Analyte	Historical range	October 2022 - September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
SD306	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD307	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD308	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD314	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD315	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD316	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD405	PFOS+PFHxS	<0.0002 – 0.0006	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002 – 0.0006	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD407	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD409	PFOS+PFHxS	<0.0002 – 0.0011	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002 – 0.0011	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD411	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD413	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD415	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
		New Minimum			**New Maximum**	

7.4.2.5 Accommodation Area

A summary of the PFOA, PFOS, and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the accommodation area monitoring locations is presented in Table 7-27.

- PFOS and PFOS+PFHxS concentrations were reported above the LOR in all samples.
- No sample reported a concentration of PFOA above the LOR during the monitoring period.
- A new minimum concentration of PFOS and PFOS+PFHxS was identified at SD346 during March 2023 (0.0004 mg/kg).

Table 7-27 Accommodation area sediment PFOS+PFHxS, PFOS, and PFOA concentrations (mg/kg)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
SD346	PFOS+PFHxS	0.0006 – 0.0177	0.0099	0.0004	0.0009	0.0013
	PFOS	0.0006 – 0.0153	0.0097	0.0004	0.0009	0.0013
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
		New Minimum			New Maximum	

7.4.2.6 Dredge Spoil and Careening Bay

A summary of the PFOA, PFOS and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the dredge spoil and Careening Bay monitoring locations is presented in Table 7-28.

- PFOS and PFOS+PFHxS concentrations were reported above the LOR at all locations in June 2023. No other PFOS or PFOS+PFHxS result was reported above the LOR.
- No location reported a concentration of PFOA above the LOR during the monitoring period.
- SD375 recorded a new PFOS and PFOS+PFHxS concentration maximum (0.0030 mg/kg) in June 2023. The new maximum was within the same order of magnitude as historical maximum.
- There was no first-time detection for PFOS+PFHxS or PFOA during the monitoring period.

Table 7-28 Dredge spoil and careening bay sediment PFOS+PFHxS, PFOS, and PFOA concentrations (mg/kg)

Location ID	Analyte	Historical range	October 2022 – September 2023 Monitoring Period			
		Min – Max	Dec-22	Mar-23	Jun-23	Sep-23
SD374	PFOS+PFHxS	<0.0002 – 0.0006	<0.0002	<0.0002	0.0005	<0.0002
	PFOS	<0.0002 – 0.0006	<0.0002	<0.0002	0.0005	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD375	PFOS+PFHxS	<0.0002 – 0.0012	<0.0002	<0.0002	0.0030	<0.0002
	PFOS	<0.0002 – 0.0012	<0.0002	<0.0002	0.0030	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD378	PFOS+PFHxS	<0.0002 – 0.0005	<0.0002	<0.0002	0.0002	<0.0002
	PFOS	<0.0002 – 0.0005	<0.0002	<0.0002	0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
		New Minimum			New Maximum	

8 Interpretive Analysis

The following sections present a high-level interpretation for each monitoring area, based on the available data set for each media monitored. The data used for the interpretive analysis include groundwater monitoring data obtained since 2017, porewater and surface water monitoring data collected since March 2018 and sediment monitoring data collected since January 2020.

Trends in groundwater concentrations over time have been assessed using the Mann-Kendall trend test to assess the extent of PFAS concentrations. A minimum of four results per monitoring location are required to calculate a potential trend (i.e., increasing, stable or decreasing). The Mann Kendall test relies on several statistical metrics, including:

- The Mann Kendall **'S' Statistic** indicates whether concentration trend versus time is generally decreasing (S<0) or increasing (S>0). Where the value is zero, there is no overall trend.
- The **Confidence Factor (CF)** value indicates the degree of confidence in the trend result as in "Decreasing" vs. "Possibly Decreasing" or "Increasing" vs. "Possibly Increasing". A CF between 90% and 95% indicate a "Possibly" increasing or decreasing trend, when CF>95% the data demonstrate a strong trend, either "Increasing" or "Decreasing".
- The **Coefficient of Variation (CoV)** is used to distinguish between a 'No Trend' result and a 'Stable' result for a dataset with no significant increasing or decreasing trend.

For practicality, GSI Mann-Kendall Toolkit for Constituent Trend Analysis (GSI, 2012) outlines that a "No trend" result can be considered as evidence that concentrations are not increasing or decreasing at the relevant sampling location, similar to a "Stable" trend result.

Mann Kendall test results are presented in Appendix D and summarised in the following sections.

The outcomes of the Mann-Kendall statistical analysis are to be read in conjunction with the associated confidence factors and the spatial location of the monitoring wells to assess PFAS concentrations.

8.1 Fire Training Area

The spatial extent of groundwater, porewater and surface water PFOS+PFHxS concentrations at the FTA is shown (Appendix A) in Figure 8B (Dec-22), Figure 9B (Mar-23), Figure 10B (Jun-23) and Figure 11B (Sept-23). The PFOA concentrations are displayed in Figure 12B (Dec-22), Figure 13B (Mar-23), Figure 14B (Jun-23) and Figure 15B (Sept-23). The sediment PFOS+PFHxS results are shown in Figure 16B (Dec-22), Figure 17B (Mar-23), Figure 18B (Jun-23) and Figure 19B (Sept-23).

Groundwater monitoring wells MW109, MW112, MW120, MW121, MW123, MW128 and MW500 are targeting the FTA source area and MW124, MW125, MW126 and MW127 are positioned downgradient, along the shoreline. Porewater, sediment and surface water locations along the shoreline are also monitored. The outcomes of the Mann Kendall test are summarised in Table 8-1.

Table 8-1 Mann-Kendall Trend Analysis Summary – Fire Training Area

Location	PFOS Trend	CF (%)	PFOA Trend	CF (%)	PFOS+PFHxS Trend	CF (%)
MW109	No Clear Trend	53	Decreasing	>99	Decreasing	98
MW112	Possibly Increasing	90	Stable	77	No Clear Trend	86
MW120	Stable	67	No Clear Trend	78	No Clear Trend	5
MW121	No Clear Trend	83	No Clear Trend	18	No Clear Trend	31
MW123	Decreasing	>99	Possibly Decreasing	95	No Clear Trend	2
MW124	Decreasing	98	No Clear Trend	51	Decreasing	98
MW125	No Clear Trend	84	Decreasing	>99	Increasing	>99
MW126	Decreasing	>99	NA(1)	NA(1)	Decreasing	99
MW127	Decreasing	98	No Clear Trend	74	Decreasing	>99
MW128	No Clear Trend	<1	Decreasing	95	No Clear Trend	<1
MW500	Stable	73	Stable	73	Stable	68

Notes:

(1) Trend Not Analysed – no detection above the laboratory LOR. Can be considered "stable" for the purpose of trend analysis.

The results of the Mann-Kendall analysis indicate a mix of stable and decreasing trends, with isolated increasing or possibly increasing trends at two monitoring wells (MW125 and MW112, respectively).

An isolated increasing PFOS+PFHxS trend is noted at downgradient well MW125 (located on the coastline downgradient of the FTA). Concentrations at MW125 were however within historical range, and other coastline wells (namely MW124, MW126 and MW127) reported decreasing PFOS+PFHxS trends with no concentration recorded above the LOR this monitoring period.

A new PFOS+PFHxS concentration maximum was reported at sediment monitoring location SD340 in March 2023, as well as a new exceedance of the drinking water criteria at PW335. These did not represent an order of magnitude change from historical range. Adjacent surface water, porewater and sediment monitoring locations reported concentrations either below the LOR or within historical range.

Consistent with previous investigations, the above interpretation suggests the migration of PFAS is occurring with groundwater flow from the FTA towards the east shore. However, the relatively low level of detections in coastline wells, porewater and surface water compared to groundwater concentrations at the source area indicates that the PFAS extent remains unchanged from previous investigations. The effects of dispersion and dilution at the point of discharge along the coast would further reduce the PFAS concentrations within the marine environment.

8.2 Demolition Ground

The spatial extent of groundwater, porewater and surface water PFOS+PFHxS concentrations at the demolition ground is shown (Appendix A) in Figure 8A (Dec-22), Figure 9A (Mar-23), Figure 10A (Jun-23) and Figure 11A (Sept-23). The PFOA concentrations are displayed in Figure 12A (Dec-22), Figure 13A (Mar-23), Figure 14A (Jun-23) and Figure 15A (Sept-23). The sediment results are shown in Figure 16A (Dec-22), Figure 17A (Mar-23), Figure 18A (Jun-23) and Figure 19A (Sept-23).

MW139, MW141 and MW147 are targeting the demolition ground source area; and MW142 and MW149 are situated along the shoreline. The outcomes of the Mann Kendall test are summarised in Table 8-2.

Table 8-2 Mann-Kendall Trend Analysis Summary – Demolition Ground

Location	PFOS Trend	CF (%)	PFOA Trend	CF (%)	PFOS+PFHxS Trend	CF (%)
MW139	No Clear Trend	88	No Clear Trend	83	Decreasing	99
MW141	No Clear Trend	86	Stable	62	Stable	64
MW142	No Clear Trend	88	Increasing	>99	Stable	<1
MW147	Possibly Increasing	92	No Clear Trend	4	Increasing	98
MW149	Decreasing	>99	No Clear Trend	89	Decreasing	>99

The results of the Mann-Kendall analysis indicate a decreasing PFOS+PFHxS trend at MW139 (source area) from a 'possibly decreasing' trend reported last monitoring period. MW139 is likely to be located upgradient of the groundwater impact as PFOS+PFHxS was only recorded once above the LOR during the monitoring period and remained of the same order of magnitude as the LOR as per historical results.

Monitoring wells, MW141 and MW142, consistently reported the highest PFOS+PFHxS concentrations, which were above the recreational criteria of 2 µg/L. PFOA concentrations were also recorded above the drinking water criteria. Stable or increasing trends of PFOA and PFOS+PFHxS were identified at these wells consistent with the previous monitoring period.

MW149, positioned south of MW141, MW142 and MW147, did not report any PFAS concentrations above the LOR during the monitoring period. Decreasing trends for PFOS and PFOS+PFHxS were also identified at this well. These observations confirm that the groundwater PFAS impact is primarily situated directly east of MW139 and in the vicinity of MW141, MW142 and MW147.

Porewater and surface water concentrations mostly remained below the LOR. Exceedances of the ecological protection criteria were reported at isolated porewater and surface water locations, however most results were within historical range with exception of one surface water location (refer to Section 7.3.2.2). Higher TDS and EC readings at the porewater locations and monitoring wells near the coastline indicate a mixing of groundwater with saline sea water. The effects of dispersion and dilution at the point of discharge along the coast would further reduce the PFAS concentrations within the marine environment.

No detectable concentration of PFAS was reported at any of the sediment monitoring locations downgradient of the demolition ground which is consistent with the previous monitoring periods.

The understanding of the demolition ground source area and potential exposure pathways remains unchanged from previous investigations.

8.3 Wastewater Treatment Plant

The spatial extent of groundwater, porewater and surface water PFOS+PFHxS concentrations at the WWTP is shown (Appendix A) in Figure 8B (Dec-22), Figure 9B (Mar-23), Figure 10B (Jun-23) and Figure 11B (Sept-23). The PFOA concentrations are displayed in Figure 12B (Dec-22), Figure 13B (Mar-23), Figure 14B (Jun-23) and Figure 15B (Sept-23). The sediment PFOS+PFHxS results are shown in Figure 16B (Dec-22), Figure 17B (Mar-23), Figure 18B (Jun-23) and Figure 19B (Sept-23).

The WWTP is located at the centre of Garden Island. Groundwater flow is interpreted to be radial for this area and therefore, monitoring locations are positioned both to the east and west of the WWTP.

Wells MW171, MW172, MW173, MW193, MW195S and MW195D are located around the WWTP. MW161 and MW166 are located adjacent to the seepage ponds. MW158, MW196, MW199 and MW203 are situated between the WWTP and the shoreline to the east. MW197, MW200, and MW202 are located along the coastline to the east/southeast of the WWTP. The outcomes of the Mann Kendall test are summarised in Table 8-3.

Table 8-3 Mann-Kendall Trend Analysis Summary – WWTP

Location	PFOS Trend	CF (%)	PFOA Trend	CF (%)	PFOS+PFHxS Trend	CF (%)
MW158	No Clear Trend	81	NA(1)	NA(1)	No Clear Trend	81
MW161	Decreasing	>99	Stable	79	Decreasing	>99
MW166	No Clear Trend	11	No Clear Trend	68	No Clear Trend	24
MW171	No Clear Trend	51	No Clear Trend	78	No Clear Trend	58
MW172	No Clear Trend	55	No Clear Trend	29	No Clear Trend	55
MW173	Increasing	>99	Possibly Increasing	92	Increasing	98
MW193	Stable	62	No Clear Trend	31	Stable	74
MW195D	No Clear Trend	29	No Clear Trend	88	No Clear Trend	52
MW195S	No Clear Trend	86	No Clear Trend	43	Decreasing	99
MW196	No Clear Trend	77	NA (1)	NA (1)	No Clear Trend	<1
MW197	No Clear Trend	88	No Clear Trend	89	No Clear Trend	89
MW199	Decreasing	95	No Clear Trend	59	Decreasing	97
MW200	Decreasing	96	No Clear Trend	66	Decreasing	96
MW202	Decreasing	>99	No Clear Trend	88	Decreasing	>99
MW203	No Clear Trend	83	NA (1)	NA (1)	No Clear Trend	87

Notes:

(1) Trend Not Analysed – no detection above the laboratory LOR. Can be considered “stable” for the purpose of trend analysis.

Concentrations of PFOS+PFHxS consistently exceeded the recreational criteria of 2 µg/L at MW161, MW166, MW172, MW173 and MW193, all located between the WWTP and the seepage ponds. MW171 also exceeded the recreational criteria with a new concentration maximum reported in June 2023. Increasing trends were noted at MW173 located at the WWTP; however, concentrations recorded during the monitoring period were within historical range. The other source wells have displayed relatively stable concentrations since the start of the OMP late 2019 (refer to Figure 7-3).

Downgradient wells along the east coastline either displayed concentrations below, or of the same order of magnitude as, the LOR (MW196, MW197, MW199, MW200) and/or reported decreasing trends (MW199, MW200, MW202).

All porewater and sediment locations on either side of the WWTP reported concentrations within historical ranges with exception of SD401 to the west (new maximum identified in December 2022). Exceedances of the ecological protection criteria for PFOS were identified in porewater on both east and west coastlines. Concentrations were significantly lower at downgradient locations than at source area wells. Factors influencing this are likely to be the distance between the source area and the shores, dilution with rainfall and then seawater when reaching the coastline.

No detection of PFAS above the LOR was reported for the surface water locations on the west shore. Surface water locations on the east shore continued to record PFOS concentrations above the LOR and therefore the ecological protection criteria; and in isolated instances, PFOS+PFHxS above the drinking water criteria. This is consistent with observations made during previous monitoring period.

The understanding of the WWTP source area and PFAS extent remains unchanged from previous investigations. Based on the above results it appears that PFAS migration with groundwater flow continues to occur, decreasing trends and non-detections in monitoring locations along the east and west shorelines are consistent with previous monitoring periods and do not indicate a change in PFAS extent or movement.

8.4 Helicopter Support Facility

The spatial extent of groundwater, porewater and surface water PFOS+PFHxS concentrations at the HSF is shown (Appendix A) in Figure 8C (Dec-22), Figure 9C (Mar-23), Figure 10C (Jun-23) and Figure 11C (Sept-23). The PFOA concentrations are displayed in Figure 12C (Dec-22), Figure 13C (Mar-23), Figure 14C (Jun-23) and Figure 15C (Sept-23). The sediment PFOS+PFHxS results are shown in Figure 16C (Dec-22), Figure 17C (Mar-23), Figure 18C (Jun-23) and Figure 19C (Sept-23). The outcomes of the Mann Kendall test are summarised in Table 8-4.

Table 8-4 Mann-Kendall Trend Analysis Summary – HSF

Location	PFOS Trend	CF (%)	PFOA Trend	CF (%)	PFOS+PFHxS Trend	CF (%)
MW214	NA (1)	NA (1)	NA (1)	NA (1)	NA (1)	NA (1)
MW215	NA (1)	NA (1)	No Clear Trend	30	No Clear Trend	72
MW216	Increasing	>99	Increasing	99	No Clear Trend	76
MW217	Decreasing	>99	Increasing	97	Decreasing	>99
MW220	Possibly Increasing	92	No Clear Trend	48	Increasing	97
MW224	No Clear Trend	62	NA (1)	NA (1)	No Clear Trend	57
MW225	Decreasing	95	NA (1)	NA (1)	Decreasing	98
MW226	Decreasing	97	No Clear Trend	73	Decreasing	98
MW227	Decreasing	>99	NA (1)	NA (1)	Decreasing	98
MW228	Possibly Decreasing	91	Increasing	>99	Increasing	>99
MW282	Stable	8	Stable	70	Stable	74

Notes:

(1) Trend Not Analysed – no detection above the laboratory LOR. Can be considered “stable” for the purpose of trend analysis.

The highest concentrations of PFOS+PFHxS were identified at wells MW216, MW220, and MW282, all positioned in the immediate vicinity of the HSF where the recreational criteria was consistently exceeded. Mann-Kendall analysis reported stable to increasing trends of PFOA and PFOS+PFHxS at these locations. It is noted that despite long-term trends reported as increasing, MW220 and MW216 reported decreasing PFOS+PFHxS and PFOA concentrations within the monitoring period (refer to Section 7.1.3.4). Further monitoring will confirm if this is an indication of source depletion.

The HSF PFAS impact seems to be mostly limited to groundwater beneath the source area as the surrounding monitoring wells and porewater monitoring locations only recorded limited detections above the LOR during the monitoring period for PFOS+PFHxS, including:

- PW405 (northeast) recorded 0.01 µg/L in March 2023 and PW415 (southeast) recorded 0.01 µg/L in December 2022.
- MW228 reported concentrations above the drinking water criteria but below the recreational criteria and displayed increasing trends. New concentration maximums were reported in December 2022 and September 2023; however, results were within the same order of magnitude as historical range.

No surface water or sediment sample collected from the HSF monitoring locations reported PFAS concentrations above the LOR.

The understanding of the HSF source area is consistent with previous investigations. Based on the results, especially at MW228, it appears that PFAS migration with groundwater flow continues to occur.

8.5 AVCAT Storage, fuel farm and drainage swale

Groundwater is the only media monitored at these sources areas as other source areas are located between the AVCAT Storage, Fuel Farm and Drainage Swale and downgradient receptors (i.e., the coastline and Careening Bay). The spatial extent of groundwater PFOS+PFHxS concentrations at the AVCAT storage, fuel farm and drainage swale are shown (Appendix A) in Figure 8C (Dec-22), Figure 9C (Mar-23), Figure 10C (Jun-23) and Figure 11C (Sept-23). The PFOA concentrations are displayed in Figure 12C (Dec-22), Figure 13C (Mar-23), Figure 14C (Jun-23) and Figure 15C (Sept-23). The outcomes of the Mann Kendall test are summarised in Table 8-5.

Table 8-5 Mann-Kendall Trend Analysis Summary – AVCAT storage, fuel farm and drainage swale

Location	PFOS Trend	CF (%)	PFOA Trend	CF (%)	PFOS+PFHxS Trend	CF (%)
Drainage Swale						
MW233	Decreasing	>99	Decreasing	>99	Decreasing	>99
Fuel Farm						
MW236	Increasing	99	Increasing	99	Increasing	>99
AVCAT Storage						
MW238	Decreasing	99	No Clear Trend	84	No Clear Trend	70
MW239	No Clear Trend	68	NA(1)	NA(1)	Possibly Increasing	93
MW240	No Clear Trend	26	Stable	46	Stable	61
MW242	Stable	3	NA(1)	NA(1)	Stable	3
MW243	No Clear Trend	31	Decreasing	99	No Clear Trend	75
MW245	Decreasing	>99	Decreasing	>99	Decreasing	>99
MW249	Decreasing	>99	Decreasing	>99	Decreasing	>99
MW496	No Clear Trend	19	Stable	42	Stable	<1
MW516	Stable	85	Stable	86	Decreasing	96

Notes:

(1) Trend Not Analysed – no detection above the laboratory LOR. Can be considered "stable" for the purpose of trend analysis.

The drainage swale monitoring well, MW233, continued to report decreasing concentrations indicating the drainage swale source may be depleting.

The fuel farm well, MW236, displayed increasing trends in PFOS, PFOA, and PFOS+PFHxS, which is consistent with previous findings. PFOS+PFHxS concentrations were elevated, exceeding the recreational criteria by one order of magnitude. However, concentrations have remained within historical range within the monitoring period (refer to Section 7.1.3.5).

The results of the Mann-Kendall analysis for the AVCAT storage source area wells indicate decreasing or stable trends. MW239 reported a possibly increasing trend for PFOS+PFHxS, however, after a new maximum recorded in December 2022, concentrations had decreased to historical range by September 2023. The understanding of PFAS extent at the AVCAT Storage has not changed from previous monitoring periods.

MW516 and MW496 located downgradient of the AVCAT storage area reported PFOS+PFHxS concentrations higher than the wells targeting the source area, and these concentrations were above the recreational criteria which is consistent with previous monitoring period. The PFAS concentrations reported at MW516 and MW496 may be indicative of PFAS migration with groundwater flow towards Careening Bay. However, concentrations have remained within historical orders of magnitude and trends are mostly stable at both locations. The understanding of PFAS extent has not changed from previous monitoring periods.

8.6 Fire Station, Flammable / hazardous goods and waste storage area and Dredged Spoil

The spatial extent of groundwater, porewater and surface water PFOS+PFHxS concentrations at the Fire station and flammable / hazardous goods and waste storage area is shown (Appendix A) in Figure 8C (Dec-22), Figure 9C (Mar-23), Figure 10C (Jun-23) and Figure 11C (Sept-23). The PFOA concentrations are displayed in Figure 12C (Dec-22), Figure 13C (Mar-23), Figure 14C (Jun-23) and Figure 15C (Sept-23). The sediment PFOS+PFHxS results are shown in Figure 16C (Dec-22), Figure 17C (Mar-23), Figure 18C (Jun-23) and Figure 19C (Sept-23).

All the wells are targeting a specific source area:

- MW255 and MW256 are located at the Fire Station.
- MW257, MW258 and MW259 are located at the flammable / hazardous goods and waste storage area.
- MW268 and MW269 are targeting the dredged spoil; and

The outcomes of the Mann Kendall test are summarised in Table 8-6.

Table 8-6 Mann-Kendall Trend Analysis Summary – Fire Station, Flammable/hazardous goods and waste storage and Dredged spoil

Location	PFOS Trend	CF (%)	PFOA Trend	CF (%)	PFOS+PFHxS Trend	CF (%)
Fire station						
MW255	Decreasing	>99	Stable	88	No Clear Trend	77
MW256	No Clear Trend	99	Increasing	98	Increasing	96
Flammable / hazardous goods and waste storage area						
MW257	No Clear Trend	79	No Clear Trend	82	Increasing	99
MW258	Stable	55	Stable	81	Stable	78
MW259	Decreasing	>99	Decreasing	>99	Decreasing	>99
Dredged spoil						
MW268	No Clear Trend	42	Decreasing	>99	Possibly Decreasing	93
MW269	No Clear Trend	2	No Clear Trend	40	No Clear Trend	55

MW256, positioned downgradient of the Fire station, continued to record higher concentrations of PFOS+PFHxS and PFOS compared to MW255. All results and trends are consistent with the previous monitoring period and confirm the understanding of the Fire station source area.

Wells positioned in the vicinity of the Flammable/hazardous goods and waste storage area (MW257, MW258 and MW259) reported elevated concentrations of PFOS and PFOS+PFHxS that exceeded the ecological protection and drinking water criteria respectively. The highest concentrations were reported at MW258, which displays stable trends despite a decrease in concentrations within the monitoring period. Concentrations at MW259 were confirmed to be decreasing which is consistent with previous monitoring periods. Results were predominantly consistent with previous investigations and don't change the understanding of PFAS extent at the flammable/hazardous goods and waste storage area.

Wells targeting the Dredged spoil recorded concentrations within historical range. Stable trends are noted at MW269 (east of source area, formerly displayed increasing trends) and MW268 is now displaying decreasing trends of PFOA and PFOS+PFHxS. Porewater and sediment results from the coastline down gradient were mostly within historical range and no surface water sample recorded concentrations above the LOR similar to the previous monitoring period. The understanding of the Dredged spoil source area remains unchanged.

8.7 Accommodation Area

The spatial extent of groundwater, porewater and surface water PFOS+PFHxS concentrations at the Accommodation Area is shown (Appendix A) in Figure 8C (Dec-22), Figure 9C (Mar-23), Figure 10C (Jun-23) and Figure 11C (Sept-23). The PFOA concentrations are displayed in Figure 12C (Dec-22), Figure 13C (Mar-23), Figure 14C (Jun-23) and Figure 15C (Sept-23). The sediment PFOS+PFHxS results are shown in Figure 16C (Dec-22), Figure 17C (Mar-23), Figure 18C (Jun-23) and Figure 19C (Sept-23). The outcomes of the Mann Kendall test are summarised in Table 8-7.

Table 8-7 Mann-Kendall Trend Analysis Summary – Accommodation Area

Location	PFOS Trend	CF (%)	PFOA Trend	CF (%)	PFOS+PFHxS+	CF (%)
MW288	Decreasing	>99	Decreasing	>99	Decreasing	>99
MW289	Stable	83	Possibly Increasing	94	No Clear Trend	<1

PFAS concentrations at MW288 have continued to decrease and PFOS+PFHxS are now reported below the recreational criteria which is confirmed by decreasing trends interpreted for PFOS, PFOA and PFOS+PFHxS. MW289 reported concentrations within the same order of magnitude as historical data. Porewater downgradient of the source area (PW346) reported a new concentration maximum in December 2022 (less than one order of magnitude from previous maximum). Following results decreased by one order of magnitude and were within historical range. This location has consistently reported relatively elevated concentrations, especially during the December/January monitoring events, and the co-located sediment results are above the LOR. However, dispersion and dilution effects would further reduce the PFAS concentrations within the marine environment. The understanding of the PFAS extent at the Accommodation area is unchanged from previous investigations.

9 Conceptual Site Model (CSM)

The potential exposure pathways for human health and ecological receptors identified during the DSI (RPS, 2018a) and ERA (RPS, 2018b) have been reviewed in light of the monitoring data obtained during the monitoring period.

The CSM presented in the PMAP (Defence, 2019) identified the following source-pathway-receptor exposure linkages:

- Leaching from impacted soil in source areas to groundwater and migration with groundwater to marine surface water.
- Exposure via dermal contact with groundwater for site workers during excavation works.
- Exposure via dermal contact or ingestion of surface water for marine fauna.
- Bioconcentration and biomagnification in the food chain and consumption of impacted aquatic organisms from Cockburn Sound and the Indian Ocean (human health).
- Bioaccumulation in the food chain and marine fauna exposure through consumption of impacted aquatic organisms from Cockburn Sound and the Indian Ocean.
- Exposure of site workers or site users to contaminated soil at the FTA.

While the PFAS concentrations in soil are not assessed as part of the OMP, the concentrations in all media monitored, and trends observed in groundwater provide an indication of the PFAS extent for each source area identified in the DSI (RPS, 2018a).

The evaluation of analytical results within this report does not suggest the nature and extent of PFAS in groundwater, porewater, surface water or sediment has significantly changed compared to that inferred from previous reporting. No new pathway, exposure scenario or potential receptors were identified, and the above linkages are considered to still be relevant for the management area.

An update of the CSM is considered required to include the new source areas that were identified by GHD in 2019 and 2020 (refer to Section 0).

10 Discussion

The pathways for PFAS exposure and risks to human health and ecological receptors presented in the DSI and ERA (RPS, 2018a, 2018b) are considered to still be relevant for the site, and data presented in this report does not suggest any significant changes to these mechanisms or risks.

10.1 Risk Profile

No risks requiring specific management actions other than ongoing monitoring were identified in the PMAP following completion of the DSI (RPS, 2018a) and ERA (RPS, 2018b).

There is no significant change to the risk profile of the Management Area based on the current available data based on the following:

- The analytical results collected as part of the monitoring period were predominantly consistent with the historical data. New maximums, new minimums, and new exceedances were noted at specific locations across the monitoring period but were not interpreted to represent significant changes as the order of magnitude of PFAS concentrations remained consistent with previous investigations. PFAS has not been detected at a location where it had not been detected before (i.e. no first-time detection was reported during the monitoring period).
- Interpretation of PFAS extent and movement with groundwater indicates that concentrations are largely stable or decreasing at the source areas, and slowly moving with groundwater flow towards the coastline. Concentrations detected at coastline monitoring locations are lower than these recorded at source areas. This is consistent with previous findings of the DSI (RPS, 2018a) and previous ongoing monitoring periods (Cardno, 2024).
- Where new concentration maximums have been reported in surface water or porewater, these did not represent an order of magnitude change. The following monitoring events' results were within historical range in most cases.
- Detection of PFAS in porewater and surface water were isolated and at concentrations lower than those reported in groundwater monitoring wells. It is expected that the effects of dispersion and dilution at the point of discharge along the coast would further reduce the PFAS concentrations within the marine environment.
- The concentrations reported during the monitoring period are consistent with the values used for the ERA, and the findings of the ERA are considered to remain valid.

It is also noted that abstraction of groundwater on Garden Island is restricted for potential future use due to the presence of PFAS (PMAP, Defence, 2019).

10.2 Triggers for OMP review

The OMP is to be reviewed annually considering existing trend data available to tailor the monitoring program to site-specific characteristics. A review of the OMP may be required for several reasons including (but not limited to):

- Policy changes, regulatory requirements, or regulator advice.
- Feedback and information received as part of stakeholder engagement activities.
- A change in the understanding of the risk for the site.
- Significant changes of land use within the Management Area or at close proximity.
- Impacts of remediation works; and
- The requirements of a post-remediation Site Management Plan.

The other identified potential PFAS sources (GHD, 2020) should trigger a review of the OMP to ensure these areas are adequately monitored.

In addition, and as detailed in Section 3.2, some changes to the groundwater monitoring network have been noted since the OMP and should be incorporated in a revised OMP.

Furthermore, the initial 24-month implementation period has been reached which triggers a review of the OMP.

11 Conclusions

Cardno implemented the OMP at HMAS Stirling which comprised sampling and testing of groundwater, porewater, surface water and sediment. The October 2022 – September 2023 monitoring period consisted of four quarterly monitoring events (undertaken in December 2022, March 2023, June 2023, and September 2023).

The October 2022 – September 2023 OMP monitoring was undertaken in accordance with the SAQP (Cardno 2023, Appendix B) and is considered to have met the objectives of the OMP with the following limitation: monitoring of the ship sullage area could not be completed due to the groundwater monitoring wells lost or damaged during previous monitoring periods.

Recommendations for any potential changes in the location and frequency of sampling which may be incorporated in the revision of the OMP, will be provided to Defence under a separate document.

October 2022 - September 2023 data assessment

Groundwater flow direction was interpreted to be radial from the site, which is consistent with historical observations.

Physicochemical parameters recorded for groundwater, porewater and surface water were consistent with historical monitoring data. No seasonal variation was noted, and salinity increased with proximity to the shore.

Groundwater, porewater, surface water and sediment analytical data collected as part of the monitoring period were consistent with historical data.

Where a new minimum or new maximum concentration were recorded, these were predominantly within the same order of magnitude as historical range or returned within historical range during the following monitoring events in most cases.

The outcomes of the Mann-Kendall trend analysis, conducted for each groundwater monitoring well, mainly indicate stable trends (no clear trends are considered stable) of PFAS concentrations. Increasing and decreasing trends were also identified at groundwater monitoring wells across each monitoring area. However, none of these was interpreted to represent a significant change as the order of magnitude of PFAS concentrations remained consistent with previous investigations. The understanding of each source area and associated exposure pathways remained unchanged from previous investigations.

PFAS appears to be slowly migrating with inferred groundwater flow towards the coast, consistent with previous findings. However, PFAS concentrations in groundwater, porewater, and surface water along the coastline are significantly lower than the source areas. Tidal action may be influencing PFAS concentrations at monitoring locations along the coast, and the effects of dilution and dispersion at the point of discharge are likely to significantly reduce the PFAS concentrations in the marine environments of Cockburn Sound and the Indian Ocean.

Conceptual Site Model

A review of the CSM was undertaken based on the October 2022 – September 2023 monitoring data. No new exposure pathway, receptor or transport mechanism were identified and the CSM understanding remain unchanged.

Risk Summary

No change in the risk profile of the Management Area or a specific monitoring area was established. The risk posed by residual PFAS at the site remains a low risk to human health and ecological receptors based on the available data set.

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42. Greencap, November 2019, *DSI B0086 Diamantina Pier Car Park, HMAS Stirling*.
43. RPS, May 2018, *Detailed Site Investigation – HMAS Stirling PFAS Investigation*, Ref. EEC16094.003 (RPS, 2018a).
44. RPS, September 2018, *Ecological Risk Assessment - HMAS Stirling PFAS Investigation*, Ref. EEC16094.009 (RPS, 2018b).

APPENDIX

A

FIGURES

Cardno

now

Stantec

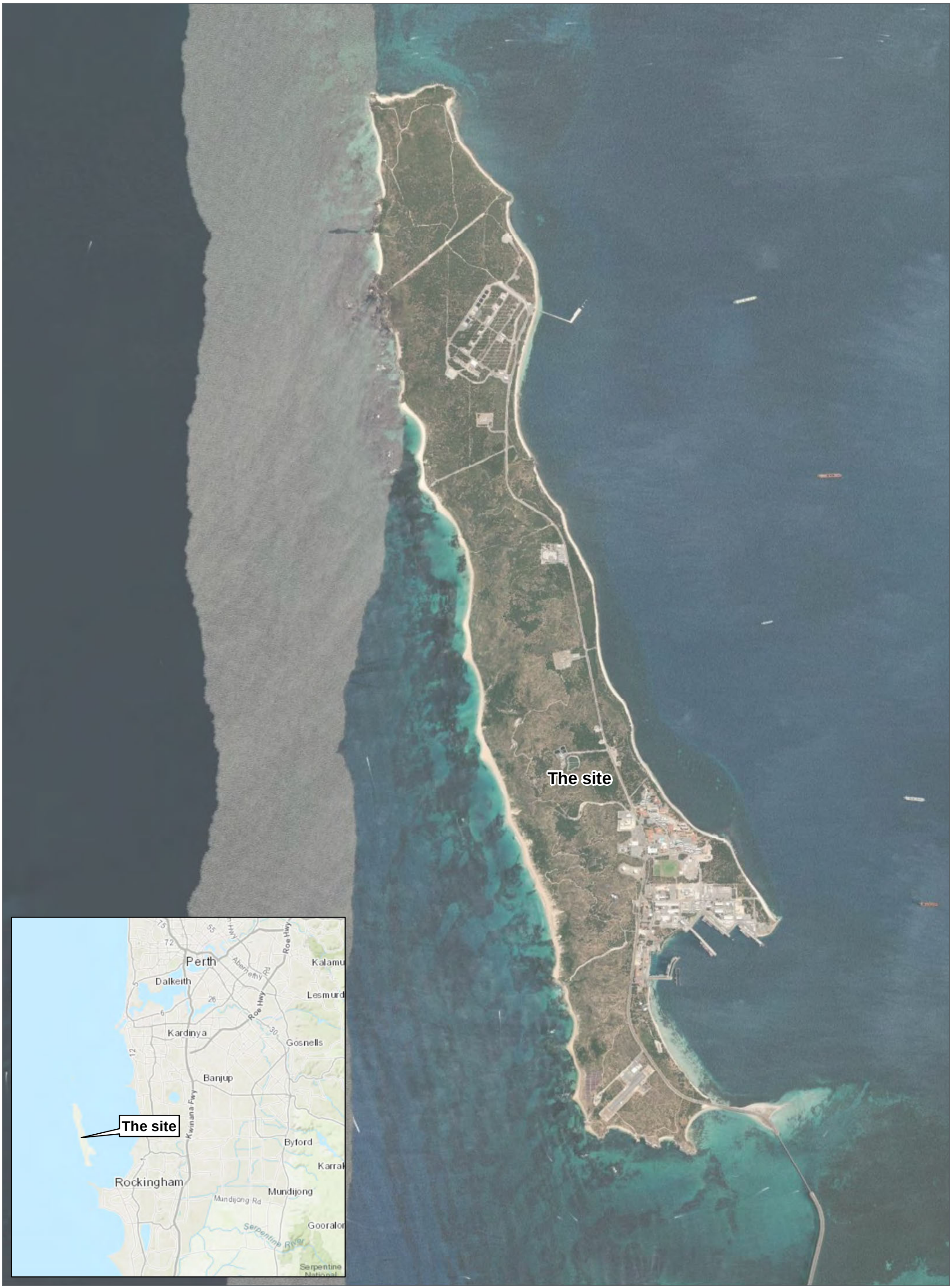

FIGURE 1

1:32,000 Scale at A3

Metres

0 500 1,000

Site Location

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-01-30 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: 304700525_WA_0089-GS-001_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Earth

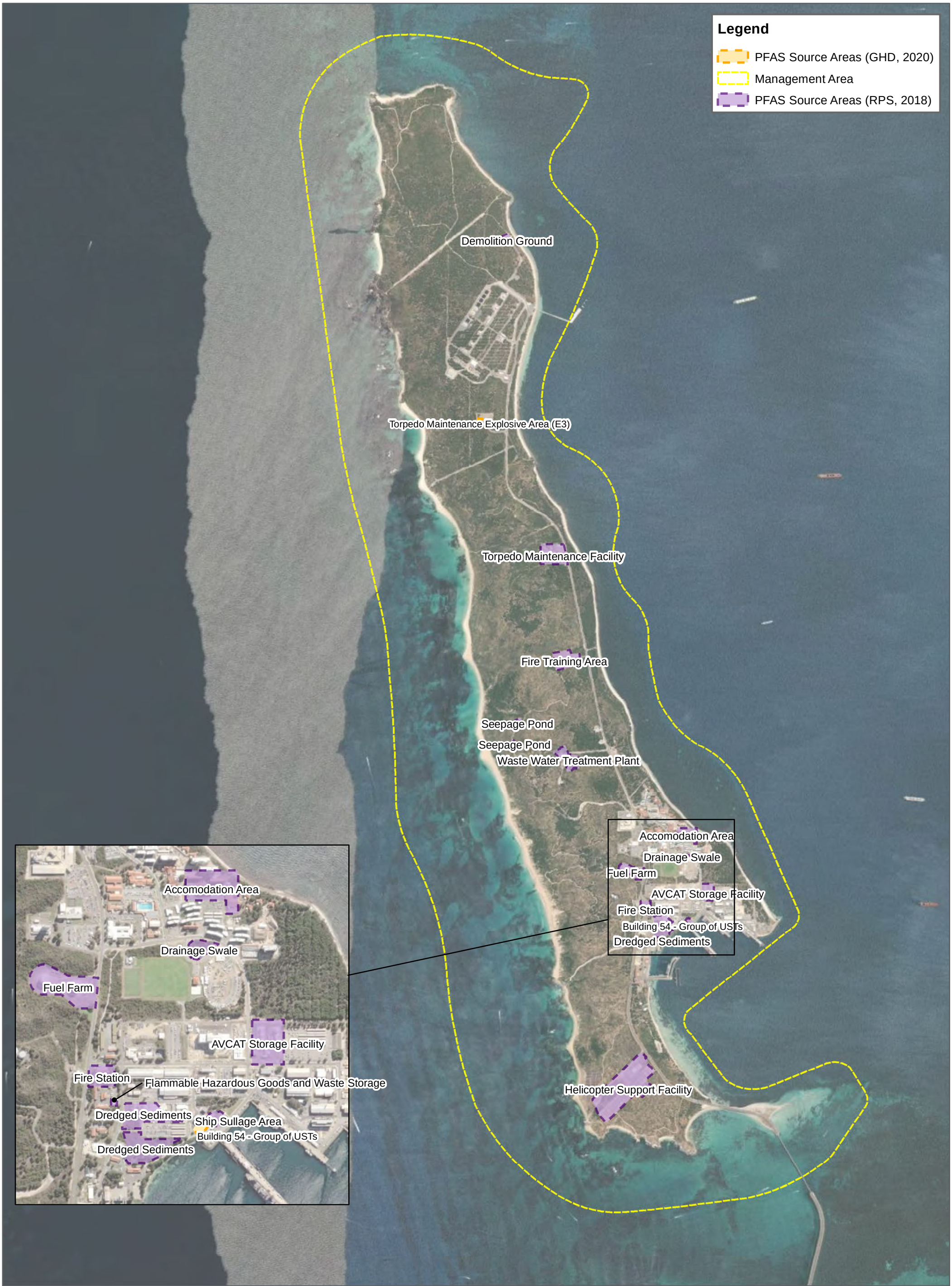

FIGURE 2

1:32,000 Scale at A3

Metres

0 500 1,000

Management Area

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2024-01-30 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: 304700525_WA_0089-GS-002_ManagementArea 02.mxd
Aerial Imagery Supplied by Google Earth

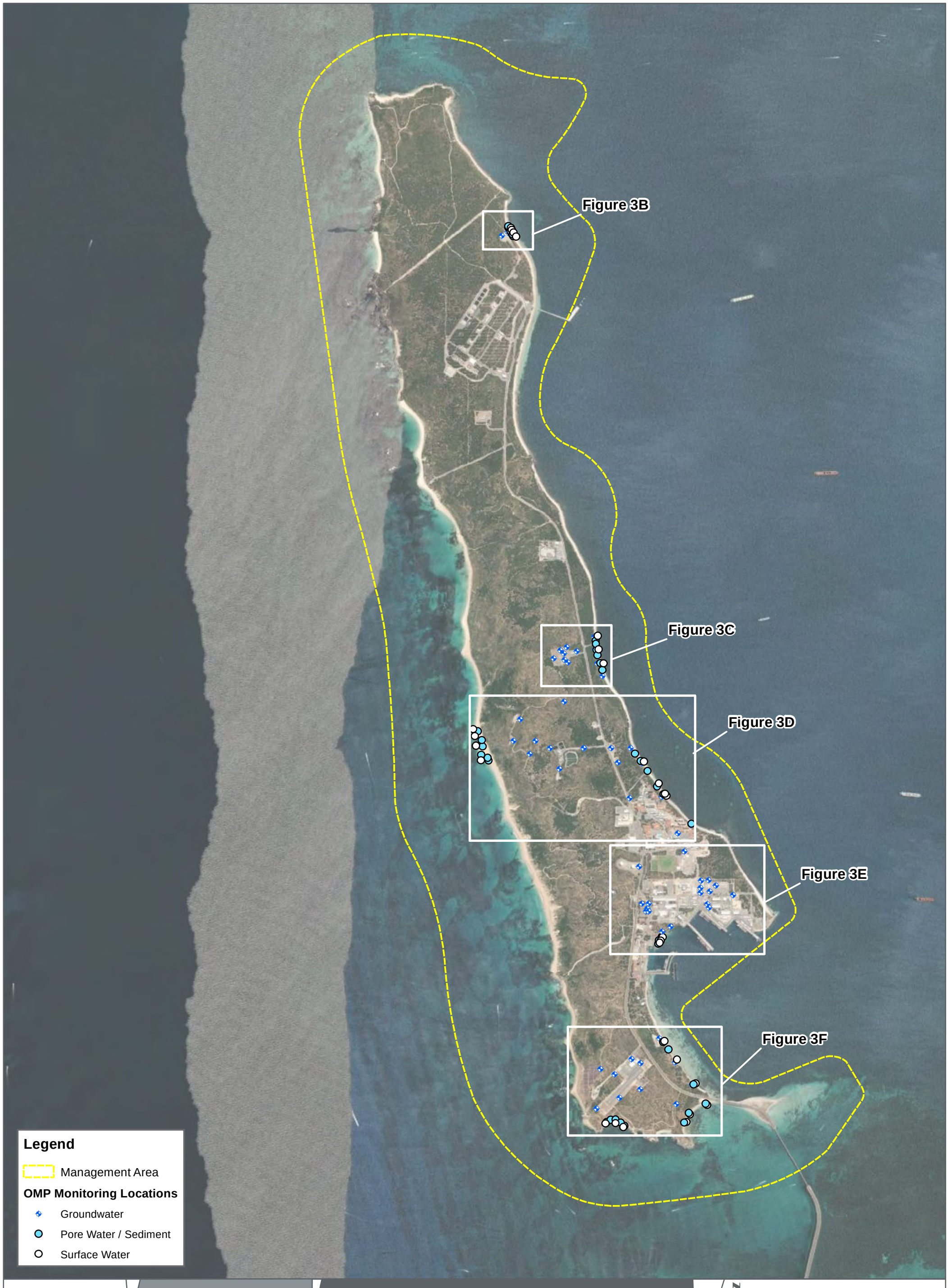

FIGURE 3A

1:32,000 Scale at A3

Metres

0 500 1,000

Monitoring Locations

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2024-01-30 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003A_MonitoringLocations 03.mxd
Aerial Imagery Supplied by Google Earth

FIGURE 3B

1:750 Scale at A3

Metres

0 25 50

Monitoring Locations

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2024-06-20 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003B_DemolitionGroundLocations 04.mxd
Aerial Imagery Supplied by Nearmap

FIGURE 3C

1:2,000 Scale at A3

Metres

0 50 100

Monitoring Locations

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-06-20 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003C_FireTrainingAreaLocations 03.mxd
Aerial Imagery Supplied by Nearmap

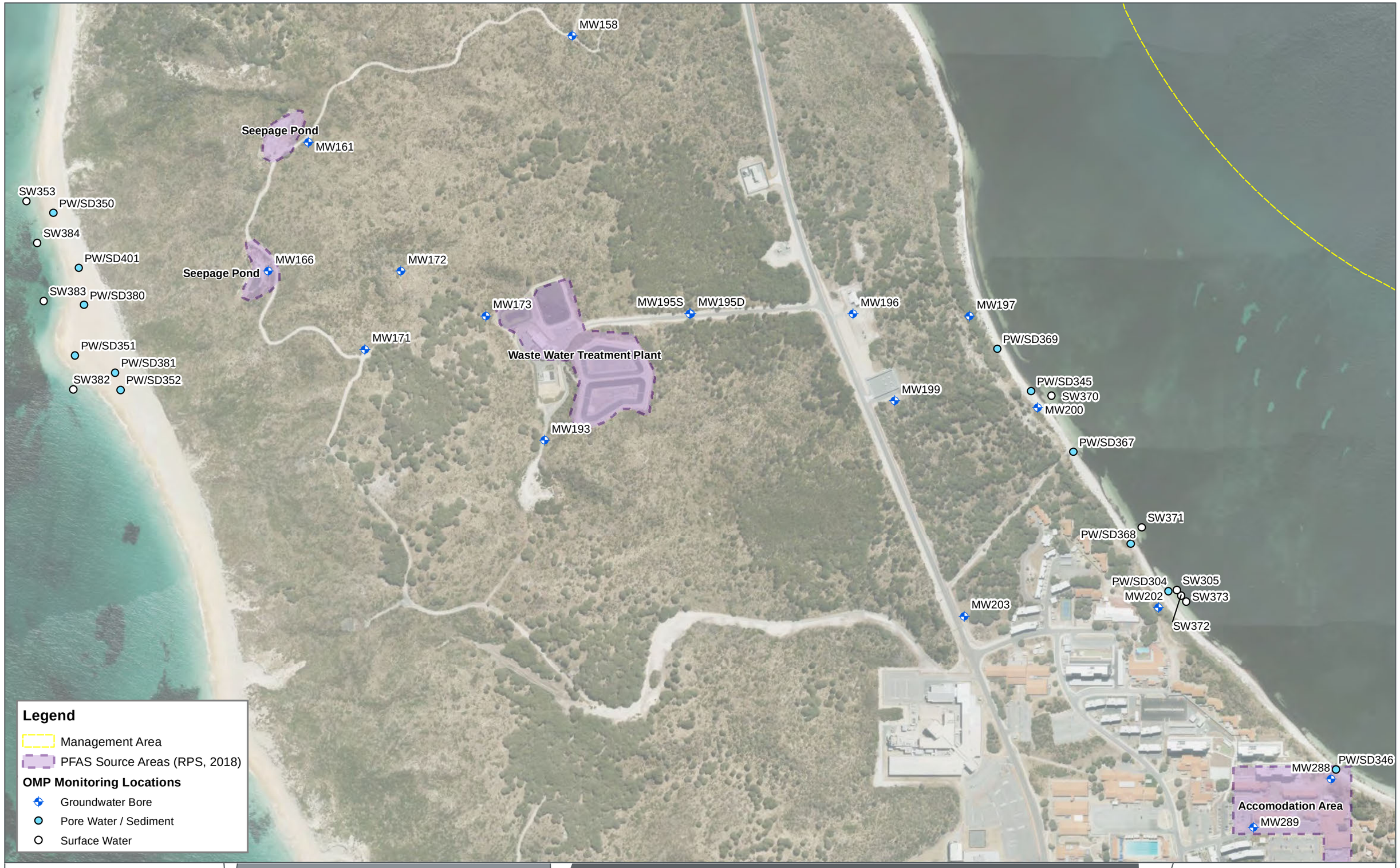

FIGURE 3D

1:5,500 Scale at A3

Metres

0 100 200

Monitoring Locations

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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Map Produced by Cardno WA
Date: 2024-07-17 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003D_WWTPLocations 03.mxd
Aerial Imagery Supplied by Nearmap

FIGURE 3E

1:3,900 Scale at A3

Metres

0 100 200

Monitoring Locations

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2024-07-17 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003E_MainBaseLocations 03.mxd
Aerial Imagery Supplied by Nearmap

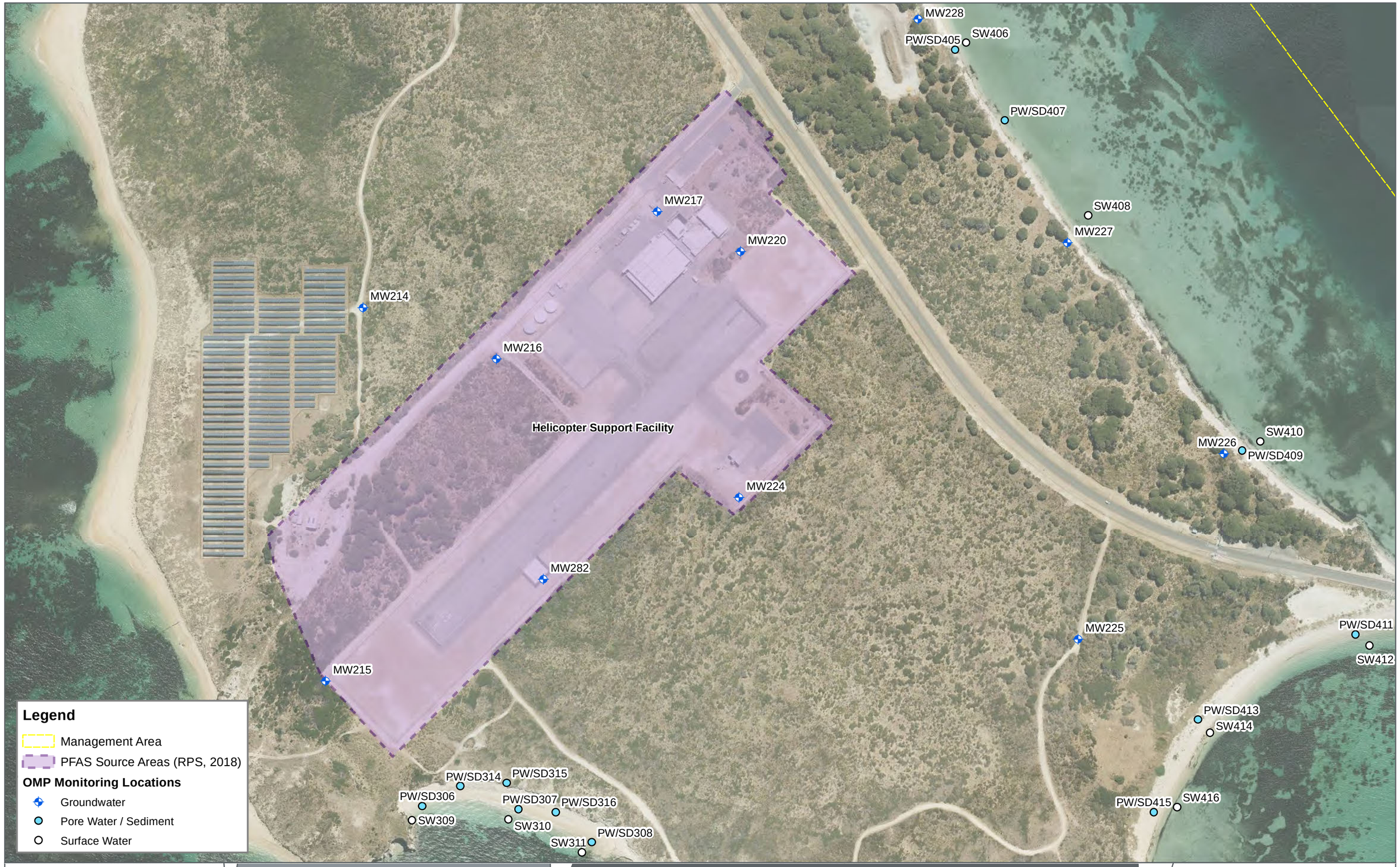


FIGURE 3F

1:3,500 Scale at A3

Metres

0 100 200

Monitoring Locations

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2024-06-20 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003F_HSFLocations 04.mxd
Aerial Imagery Supplied by Nearmap

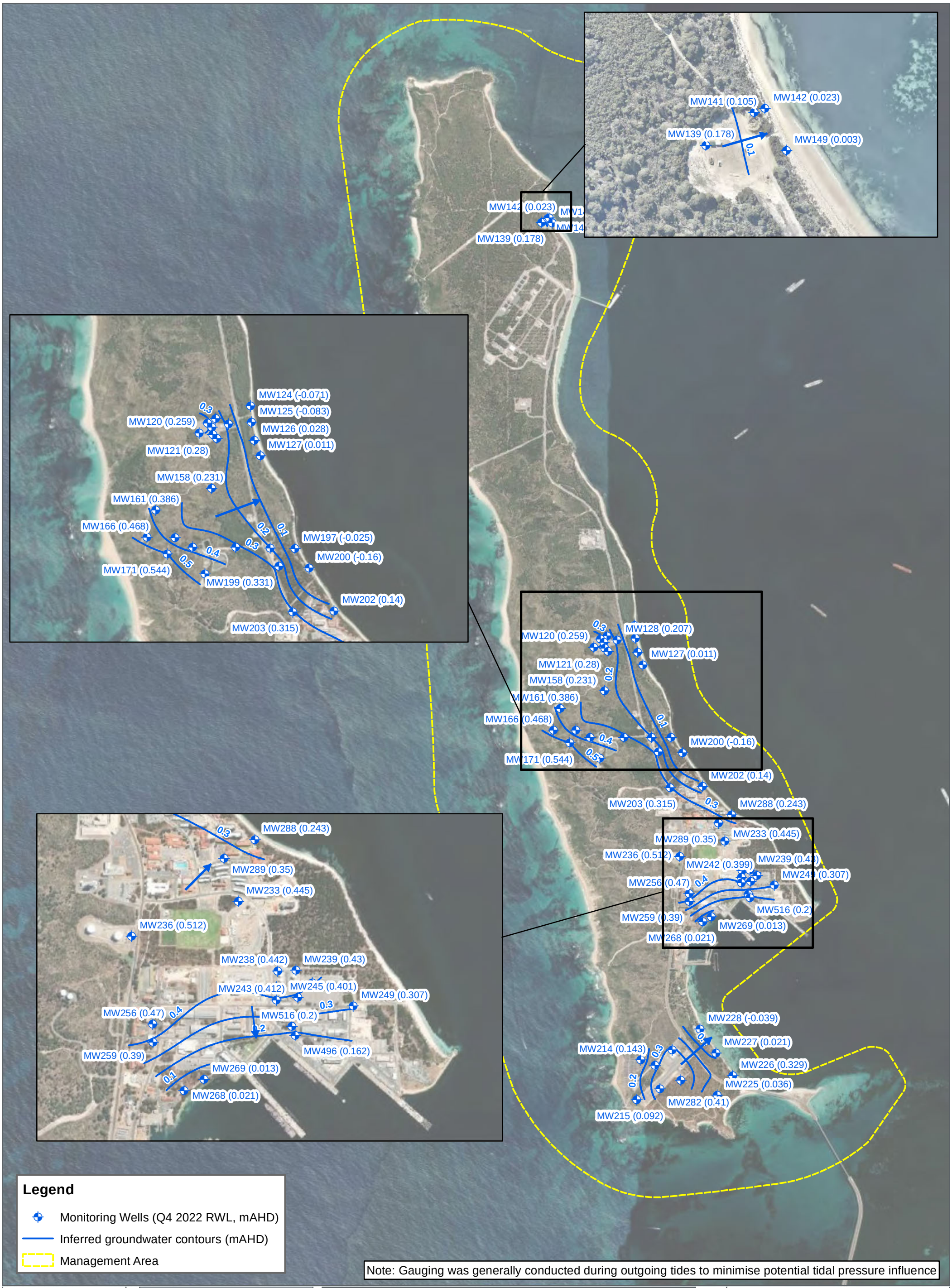


FIGURE 4

1:32,000 Scale at A3

Meters

0 500 1,000

Dec-22 Inferred Groundwater Contours

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-08-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004_2022Q4_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

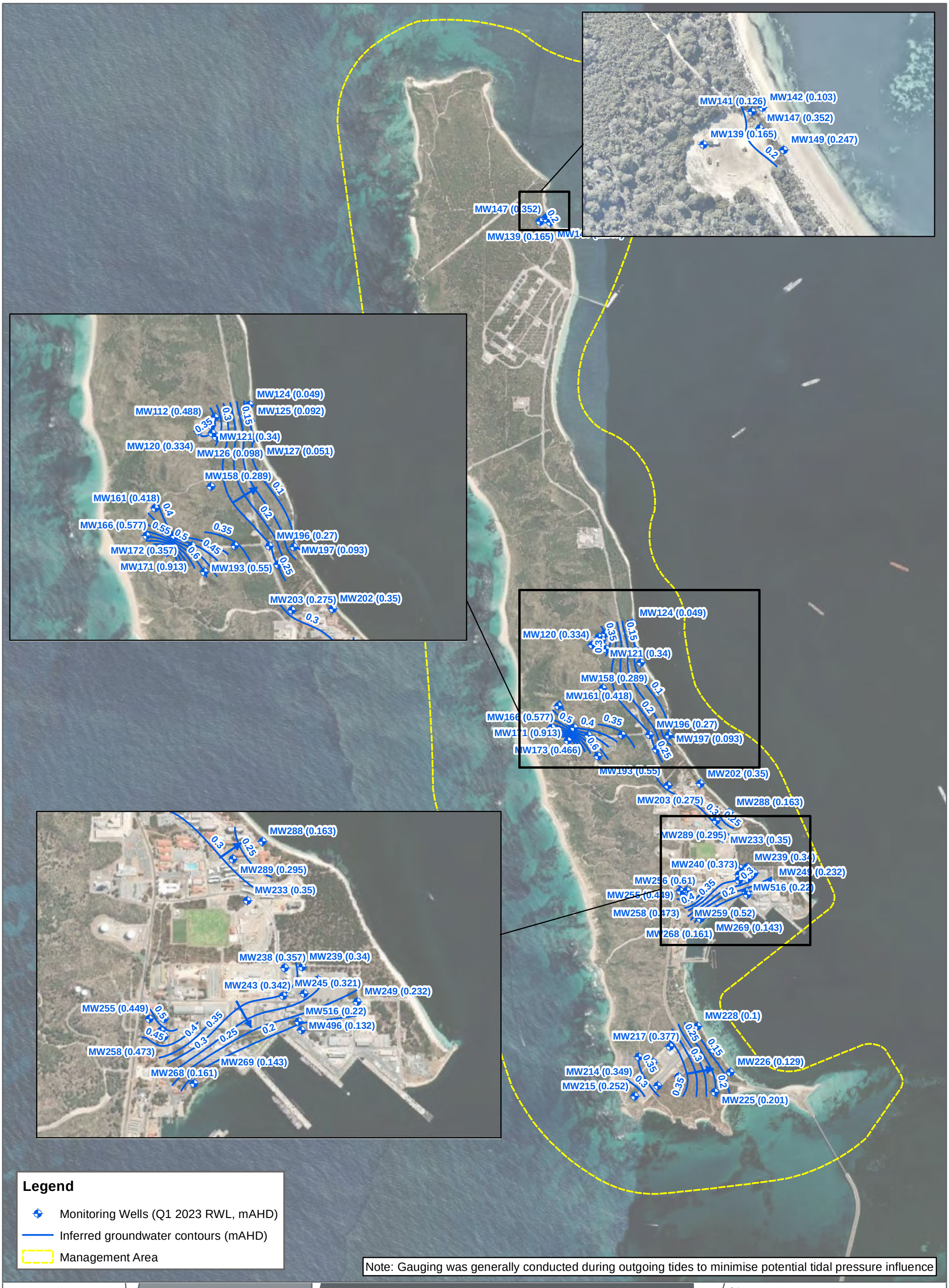


FIGURE 5

1:32,000 Scale at A3

Meters

0 500 1,000

Mar-23 Inferred Groundwater Contours

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-07-15 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005_2023Q1_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

MW141 (0.561)
MW142 (0.563)
MW147 (0.528)
MW139 (0.484)
MW149 (0.543)
0.5
MW147 (0.528)
MW139 (0.484)
MW124 (0.729)
MW128 (0.457)
MW126 (0.688)
MW127 (0.511)
MW123 (0.495)
MW158 (0.561)
MW166 (0.86)
MW197 (0.39)
MW200 (0.35)
MW171 (0.658)
MW199 (0.466)
MW193 (0.823)
MW203 (0.409)
MW202 (0.588)
0.8
0.6
0.5
0.4
0.1
0.7
MW289 (0.637)
MW288 (0.483)
MW236 (0.522)
MW239 (0.5)
MW245 (0.671)
MW249 (0.377)
MW256 (0.58)
MW259 (0.57)
MW257 (0.581)
MW516 (0.44)
MW258 (0.571)
MW496 (0.132)
MW269 (0.573)
MW268 (0.556)
MW238 (0.517)
MW243 (0.562)
MW255 (0.379)
MW228 (0.285)
MW217 (0.617)
MW226 (0.249)
MW214 (0.467)
MW225 (0.307)
MW282 (0.58)
0.3
0.9
Legend
Monitoring Wells (Q2 2023 RWL, mAHD)
Inferred groundwater contours (mAHD)
Management Area
Note: Gauging was generally conducted during outgoing tides to minimise potential tidal pressure influence
FIGURE 6
1:32,000 Scale at A3
Meters
0
500
1,000
Jun-23 Inferred Groundwater Contours
2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-07-15 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2023Q2_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

FIGURE 7

1:32,000 Scale at A3

Meters

0 500 1,000

Sept-23 Inferred Groundwater Contours

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2024-07-15 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-007_2023Q3_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

FIGURE 8A

1:10,000 Scale at A3

Metres

0 200 400

PFOS+PFHxS Concentrations - December 2022

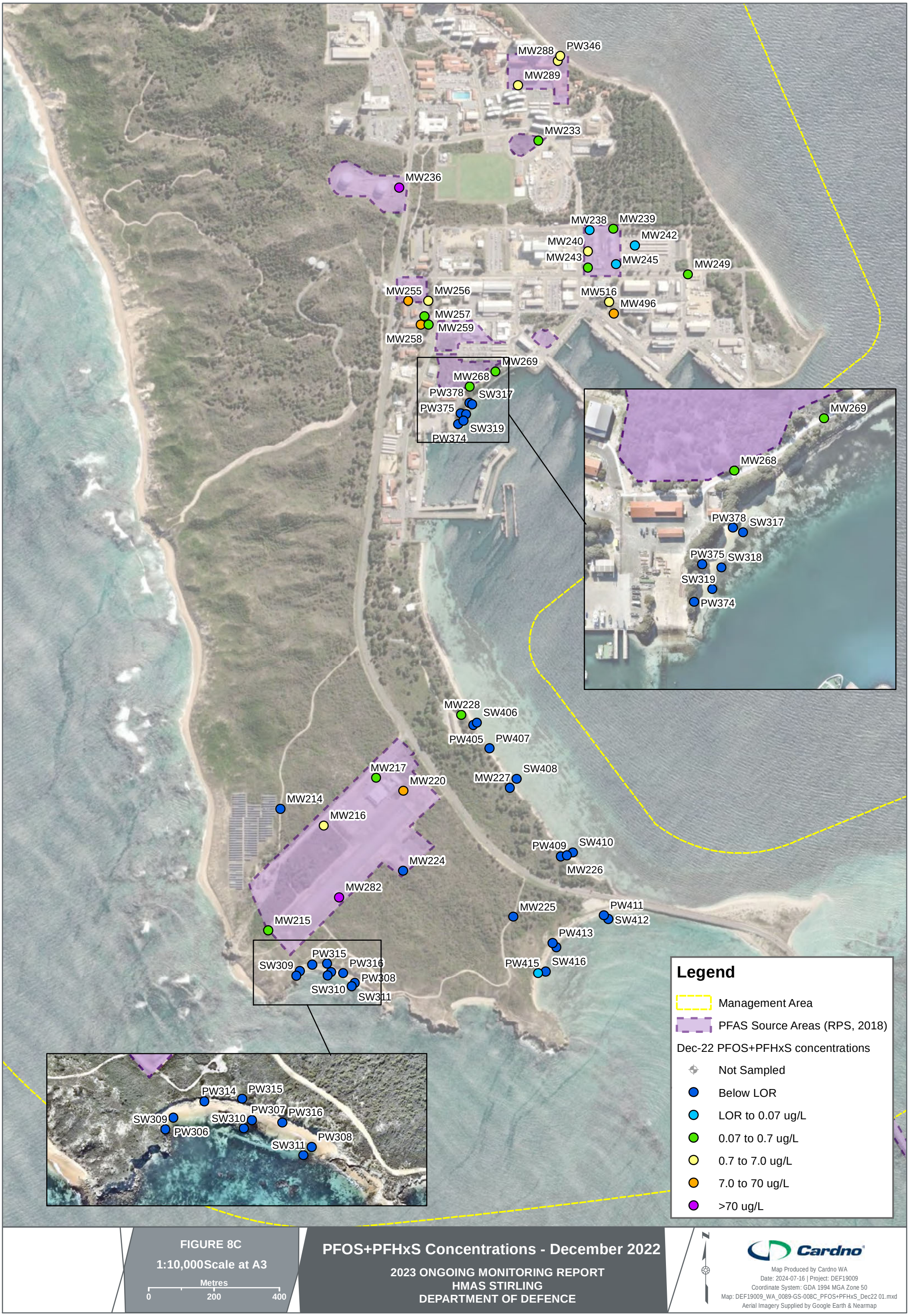
2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

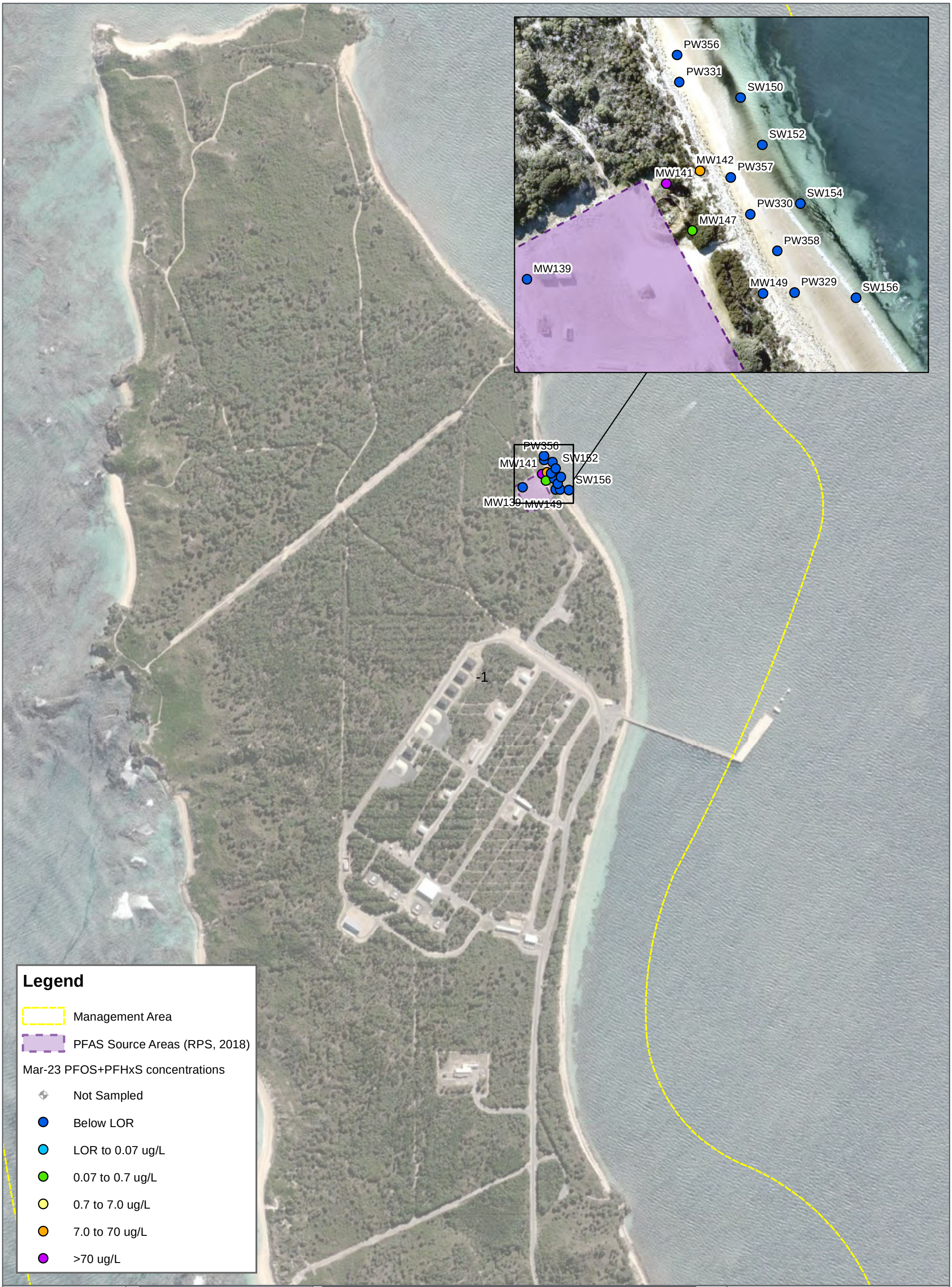
N

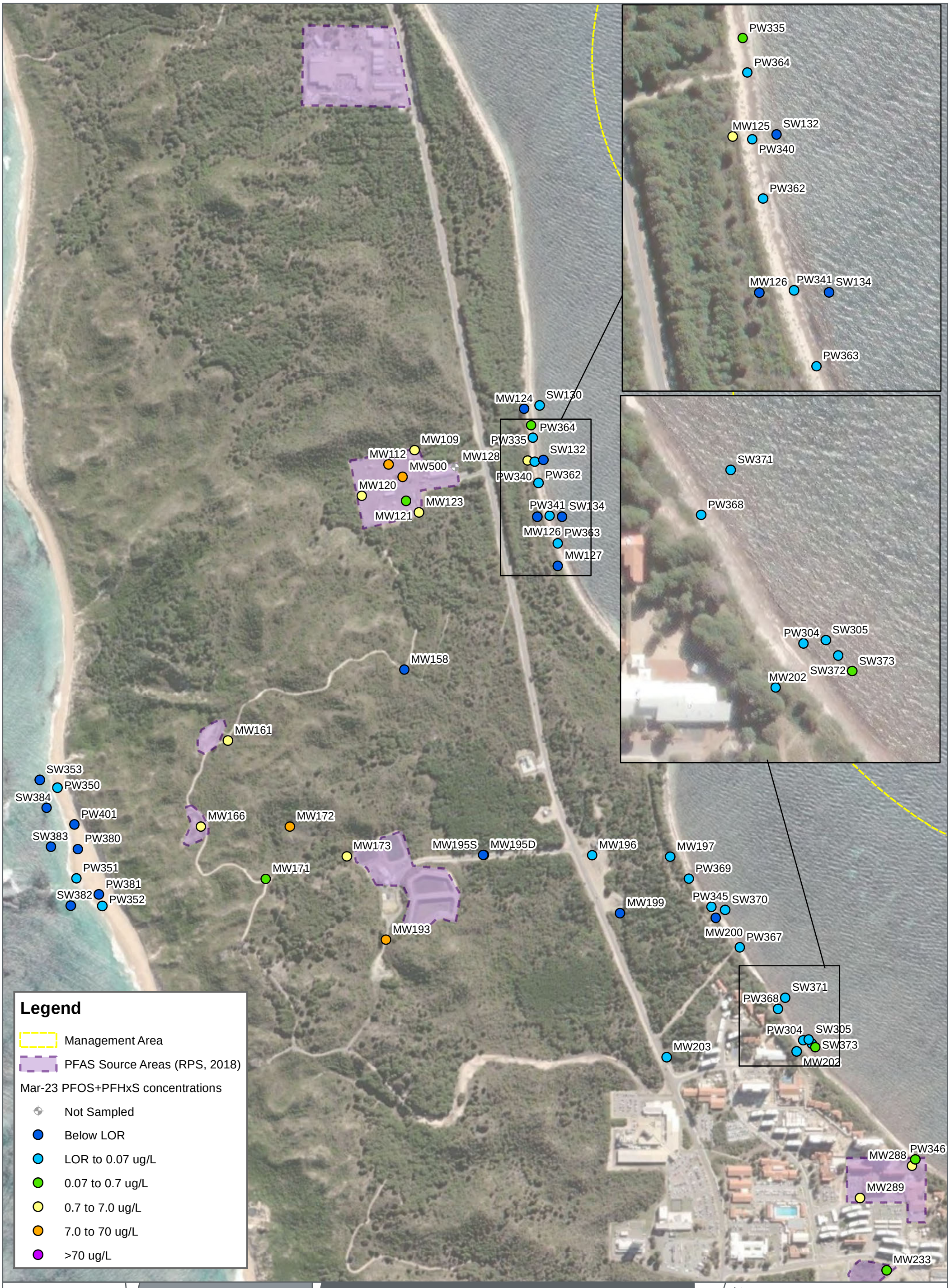
Cardno

Map Produced by Cardno WA
Date: 2024-01-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-008A_PFOS+PFHxS_Dec22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

PW335
PW364
MW125
SW132
PW340
PW362
MW126
PW341
SW134
PW363
MW124
SW130
PW364
PW335
SW132
MW109
MW112
MW128
MW500
PW340
PW362
MW120
MW123
MW121
PW341
SW134
MW126
PW363
MW127
SW371
PW368
PW304
SW305
SW373
SW372
MW202
MW158
MW161
SW353
PW350
SW384
PW401
MW166
MW172
SW383
PW380
MW173
MW195S
MW195D
MW196
MW197
PW351
MW171
PW369
PW381
SW382
PW352
MW199
PW345
SW370
MW200
PW367
SW371
PW368
PW304
SW305
MW203
SW373
MW202
PW346
MW288
MW289
MW233
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Dec-22 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.07 ug/L
0.07 to 0.7 ug/L
0.7 to 7.0 ug/L
7.0 to 70 ug/L
>70 ug/L
FIGURE 8B
1:8,000 Scale at A3
Metres
0
150
300
PFOS+PFHxS Concentrations - December 2022
2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-08-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-008B_PFOS+PFHxS_Dec22 01.mxd
Aerial Imagery Supplied by Google Earth


MW288
PW346
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW243
MW245
MW249
MW255
MW256
MW516
MW496
MW257
MW259
MW258
MW269
MW268
PW378
SW317
PW375
SW319
PW374
SW318
MW228
SW406
PW405
PW407
MW217
MW220
SW408
MW227
MW214
MW216
PW409
SW410
MW224
MW226
MW282
MW225
PW411
SW412
MW215
PW413
PW315
SW309
PW316
PW308
SW310
PW415
SW416
SW311
PW314
PW307
PW306
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Dec-22 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.07 ug/L
0.07 to 0.7 ug/L
0.7 to 7.0 ug/L
7.0 to 70 ug/L
>70 ug/L
FIGURE 8C
1:10,000 Scale at A3
Metres
0
200
400
PFOS+PFHxS Concentrations - December 2022
2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-07-16 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-008C_PFOS+PFHxS_Dec22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap


PW356
PW331
SW150
SW152
MW142
PW357
MW141
SW154
PW330
MW147
PW358
MW139
MW149
PW329
SW156
PW356
SW152
MW141
SW156
MW139
MW149
-1
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Mar-23 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.07 ug/L
0.07 to 0.7 ug/L
0.7 to 7.0 ug/L
7.0 to 70 ug/L
>70 ug/L
FIGURE 9A
1:10,000 Scale at A3
Metres
0
200
400
PFOS+PFHxS Concentrations - March 2023
2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-01-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-009A_PFOS+PFHxS_Mar23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap


PW335
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MW125
SW132
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PW362
MW126
PW341
SW134
PW363
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SW130
MW109
MW112
MW500
MW128
MW120
MW123
MW121
MW158
MW161
SW353
PW350
SW384
PW401
MW166
MW172
SW383
PW380
MW173
MW195S
MW195D
MW196
MW197
PW351
MW171
PW369
PW381
SW382
PW352
MW199
PW345
SW370
MW193
MW200
PW367
SW371
PW368
PW304
SW305
SW373
MW202
MW203
MW288
PW346
MW289
MW233
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Mar-23 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.07 ug/L
0.07 to 0.7 ug/L
0.7 to 7.0 ug/L
7.0 to 70 ug/L
>70 ug/L
FIGURE 9B
1:8,000 Scale at A3
Metres
0
150
300
PFOS+PFHxS Concentrations - March 2023
2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-01-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-009B_PFOS+PFHxS_Mar23 01.mxd
Aerial Imagery Supplied by Google Earth

MW288
PW346
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW243
MW245
MW249
MW255
MW256
MW516
MW496
MW257
MW259
MW258
MW269
MW268
PW378
SW317
PW375
SW319
PW374
SW318
SW406
MW228
PW405
PW407
MW217
MW220
SW408
MW227
MW214
MW216
PW409
SW410
MW224
MW226
MW282
MW225
PW411
SW412
MW215
PW413
PW315
SW309
PW316
PW308
SW310
SW311
PW415
SW416
PW314
PW307
SW306

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Mar-23 PFOS+PFHxS concentrations

- Not Sampled
- Below LOR
- LOR to 0.07 ug/L
- 0.07 to 0.7 ug/L
- 0.7 to 7.0 ug/L
- 7.0 to 70 ug/L
- >70 ug/L

FIGURE 9C

1:10,000 Scale at A3

Metres

0 200 400

PFOS+PFHxS Concentrations - March 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-07-16 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-009C_PFOS+PFHxS_Mar23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

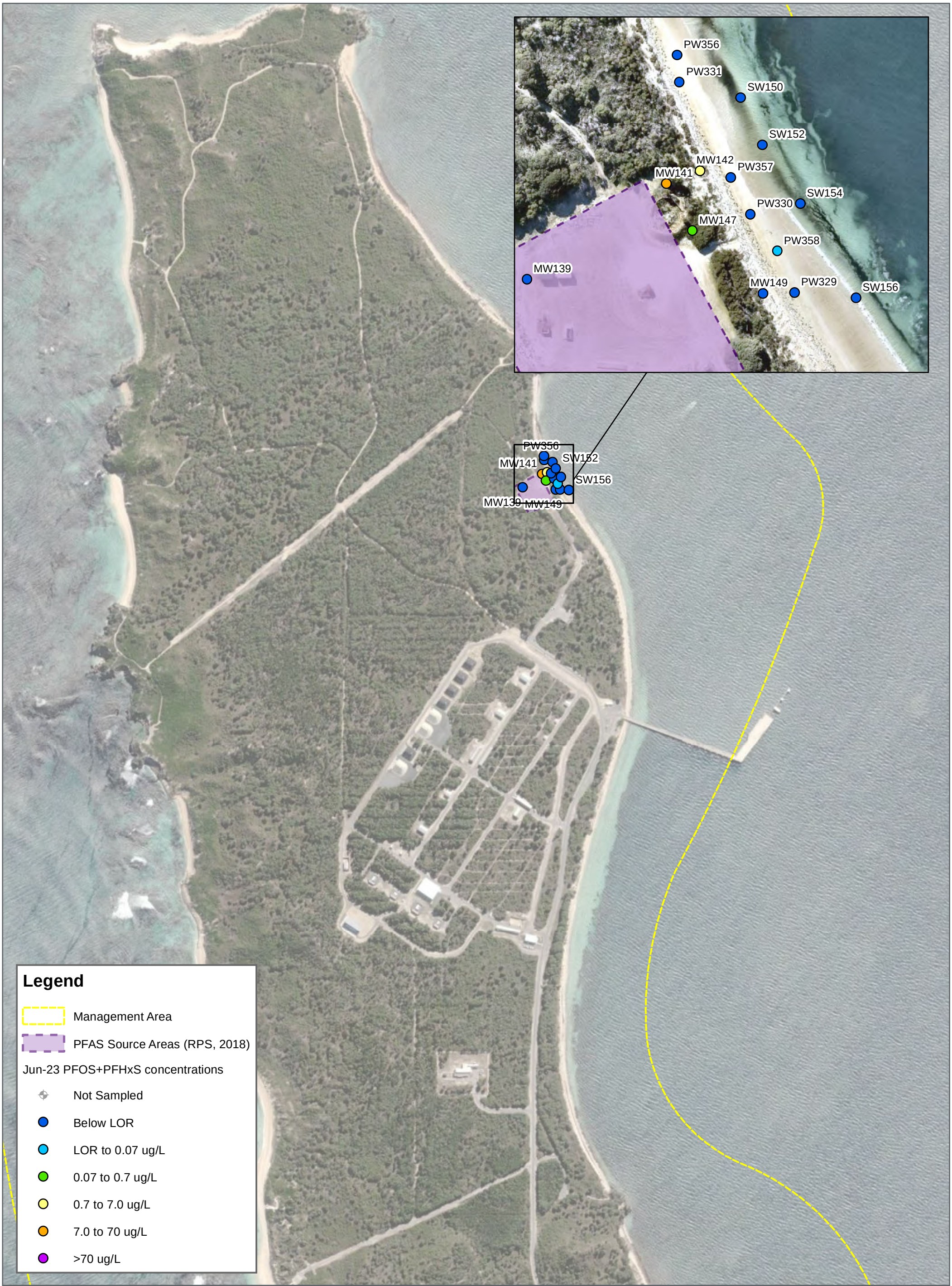


FIGURE 10A

1:10,000 Scale at A3

Metres

0 200 400

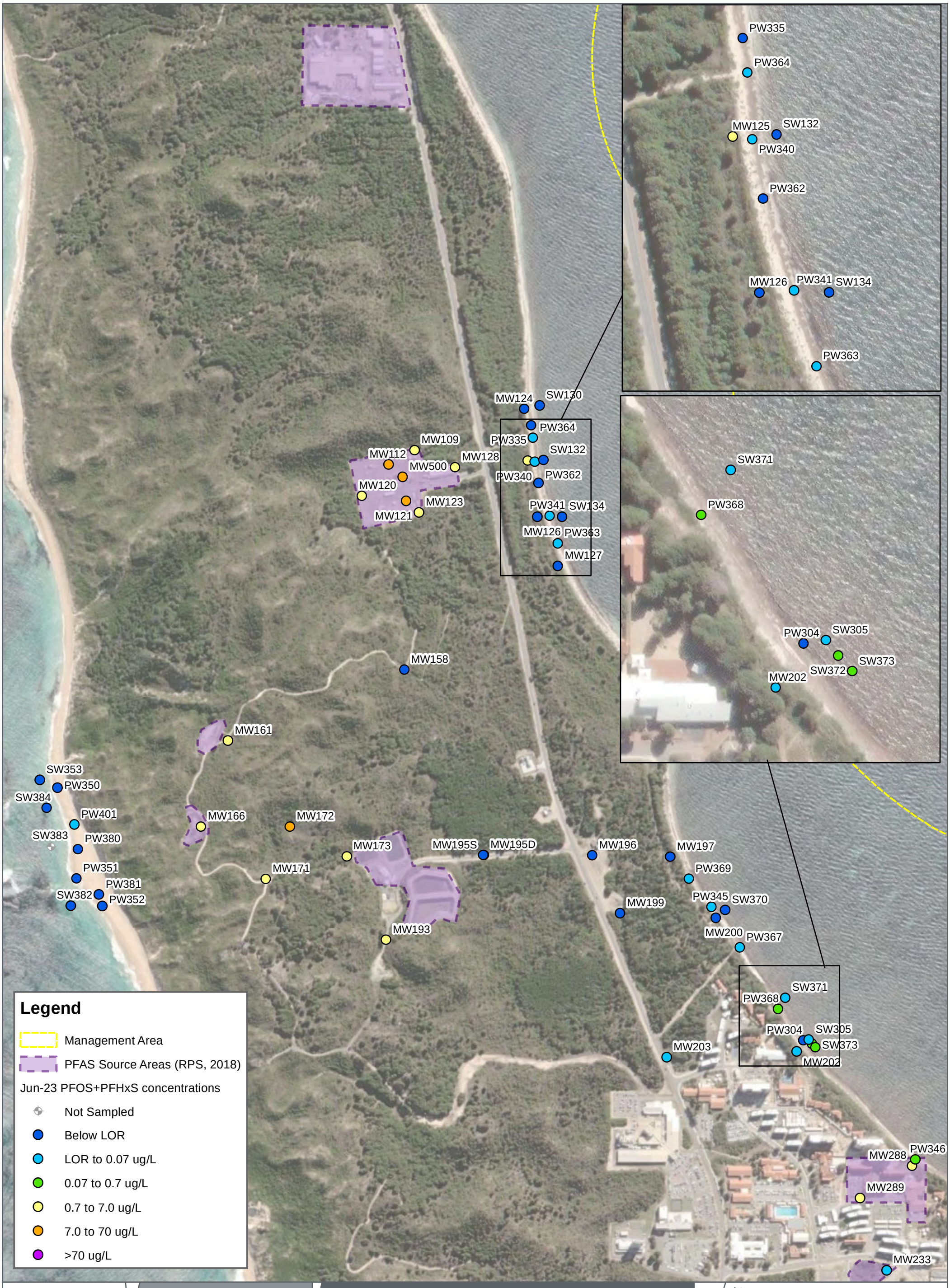
PFOS+PFHxS Concentrations - June 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-01-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-010A_PFOS+PFHxS_Jun23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap


PW335
PW364
MW125
SW132
PW340
PW362
MW126
PW341
SW134
PW363
MW124
SW130
MW109
MW112
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MW500
MW120
MW123
MW121
MW158
MW161
SW353
PW350
SW384
PW401
MW166
MW172
SW383
PW380
MW173
MW195S
MW195D
MW196
MW197
PW351
MW171
PW369
PW381
SW382
PW352
MW199
PW345
SW370
MW193
MW200
PW367
SW371
PW368
PW304
SW305
SW373
MW202
MW203
MW288
PW346
MW289
MW233
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Jun-23 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.07 ug/L
0.07 to 0.7 ug/L
0.7 to 7.0 ug/L
7.0 to 70 ug/L
>70 ug/L
FIGURE 10B
1:8,000 Scale at A3
Metres
0
150
300
PFOS+PFHxS Concentrations - June 2023
2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-01-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-010B_PFOS+PFHxS_Jun23 01.mxd
Aerial Imagery Supplied by Google Earth

MW288
PW346
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW243
MW245
MW249
MW255
MW256
MW516
MW496
MW257
MW259
MW258
MW269
MW268
PW378
SW317
PW375
SW319
PW374
MW269
MW268
PW378
SW317
PW375
SW318
SW319
PW374
MW228
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PW405
PW407
MW217
MW220
SW408
MW227
MW214
MW216
PW409
SW410
MW224
MW226
MW282
MW225
PW411
SW412
MW215
PW413
PW315
SW309
PW316
PW308
PW415
SW416
SW310
SW311
PW314
PW315
PW307
PW316
SW309
SW310
PW306
PW308
SW311

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Jun-23 PFOS+PFHxS concentrations

- Not Sampled
- Below LOR
- LOR to 0.07 ug/L
- 0.07 to 0.7 ug/L
- 0.7 to 7.0 ug/L
- 7.0 to 70 ug/L
- >70 ug/L

FIGURE 10C

1:10,000 Scale at A3

Metres

0 200 400

PFOS+PFHxS Concentrations - June 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-08-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-010C_PFOS+PFHxS_Jun23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

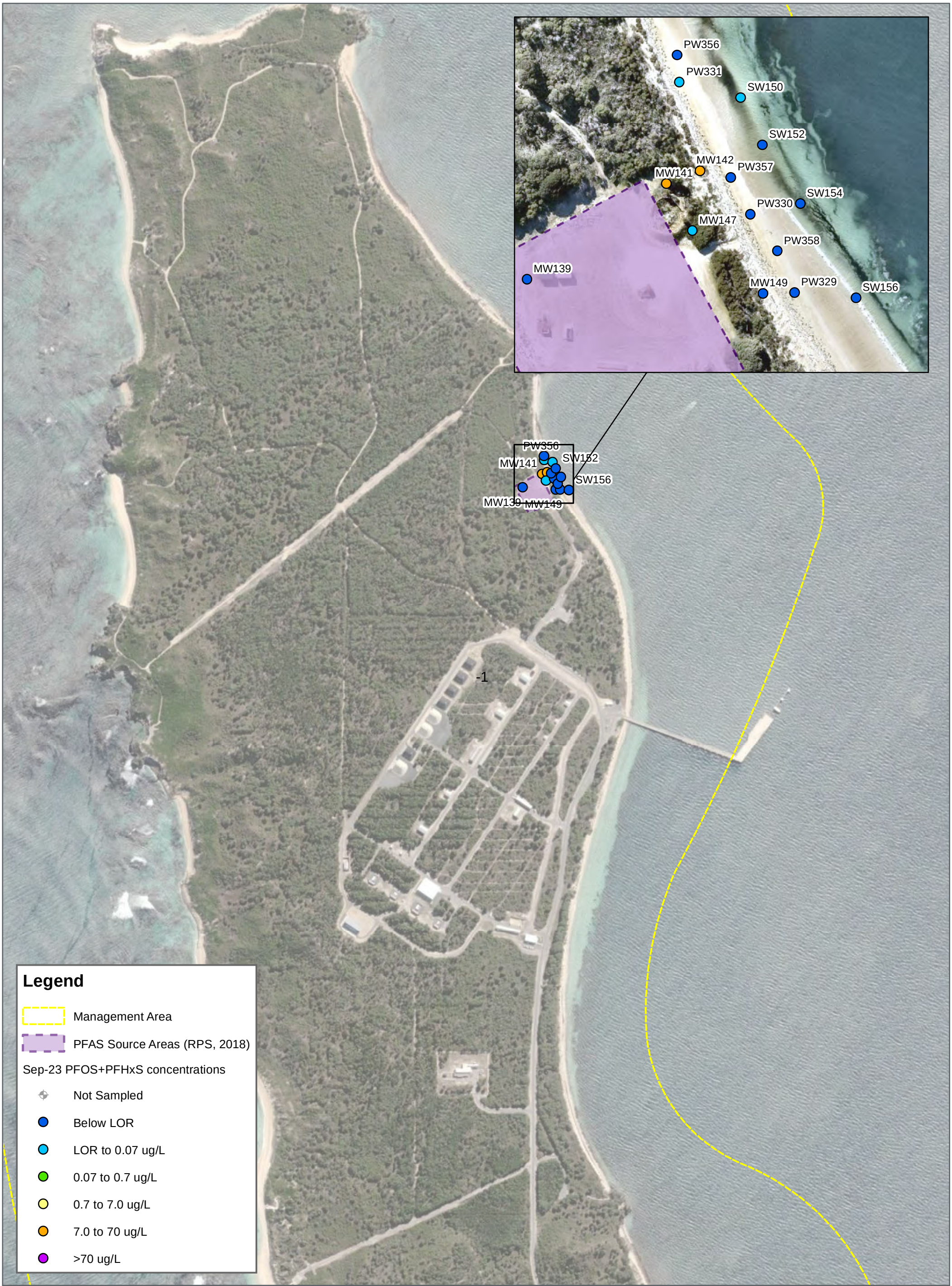


FIGURE 11A

1:10,000 Scale at A3

Metres

0 200 400

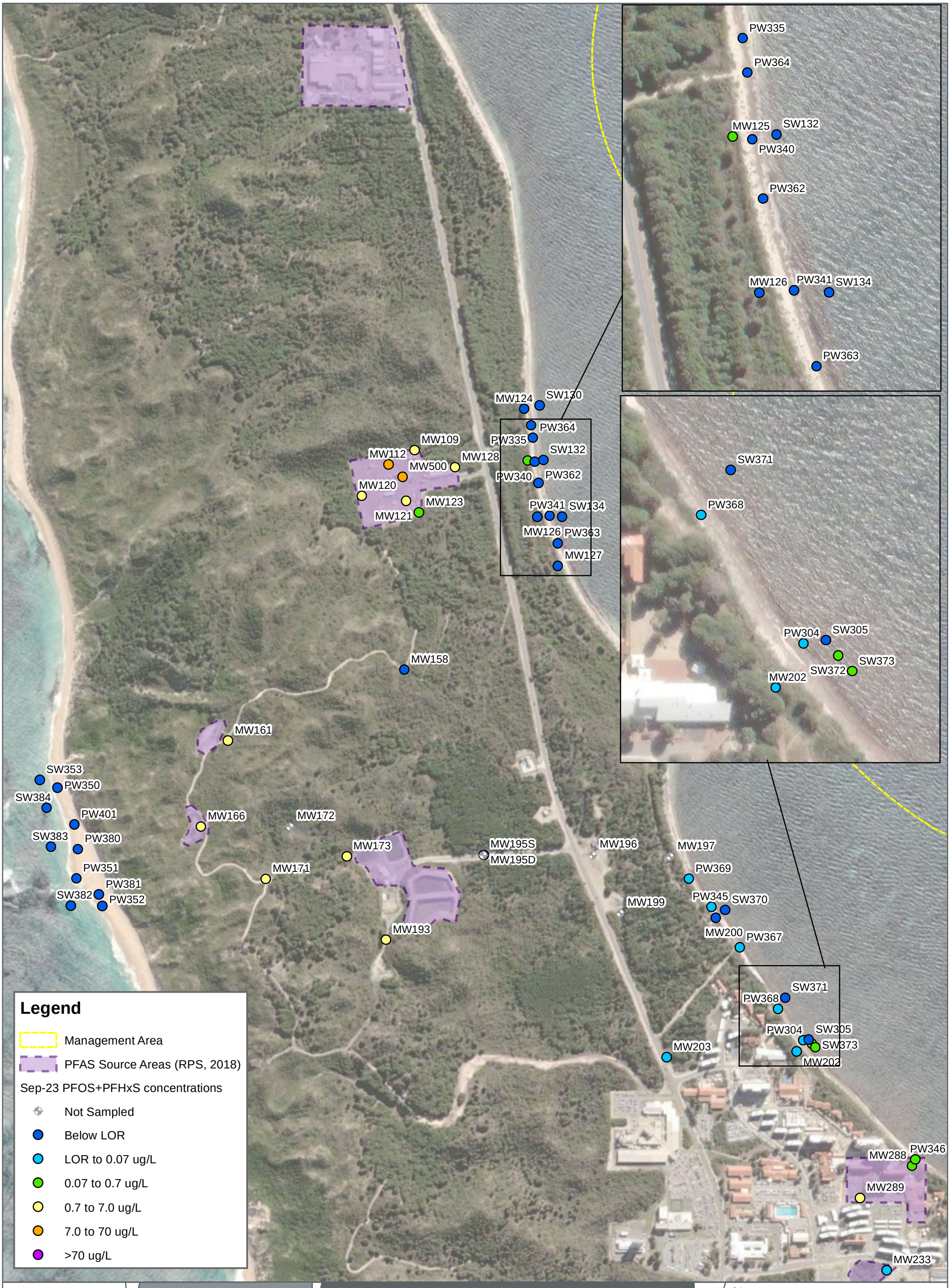
PFOS+PFHxS Concentrations - September 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-01-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-011A_PFOS+PFHxS_Sep23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap


PW335
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PW364
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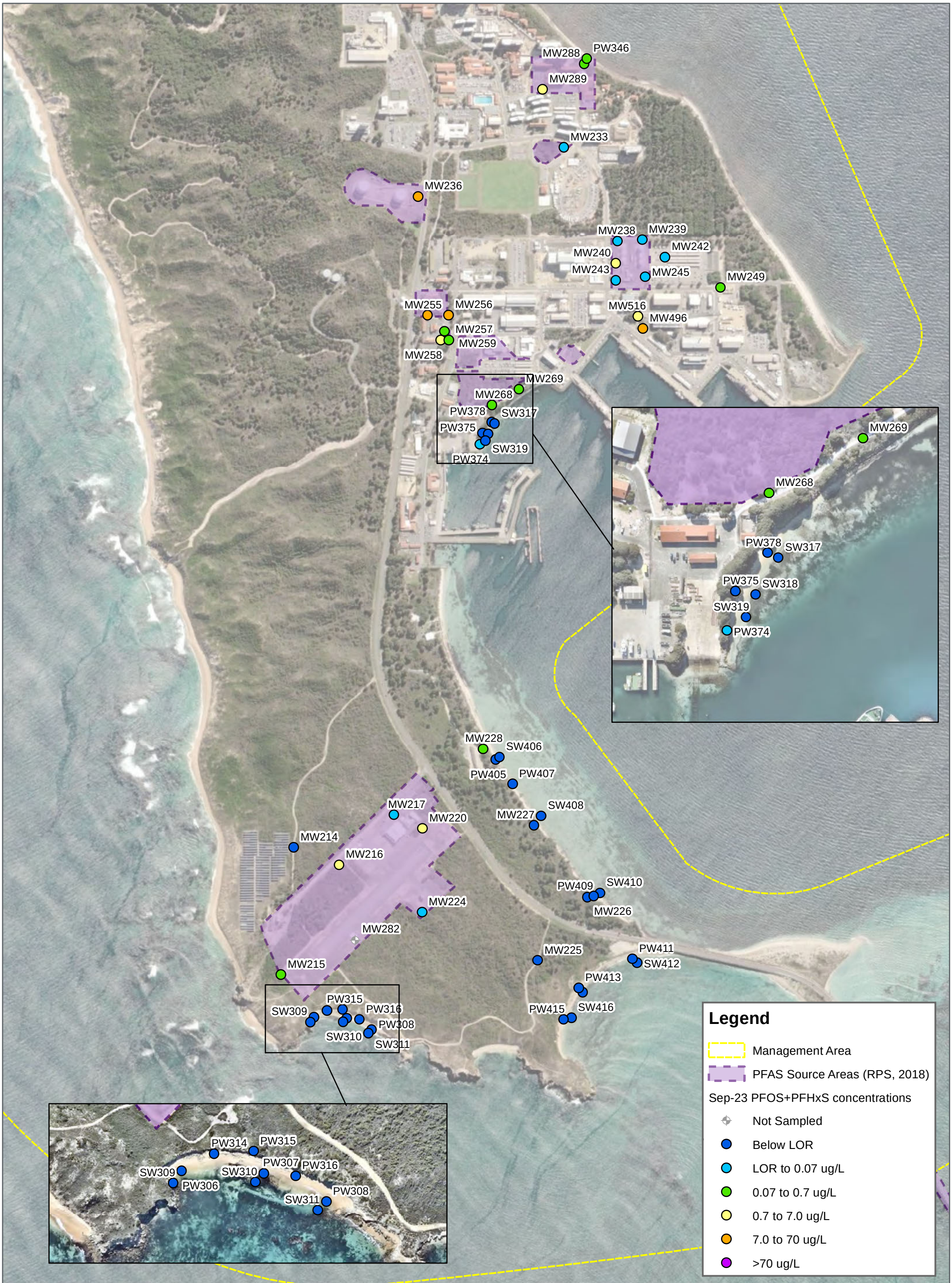
MW112
MW128
MW500
PW340
PW362
MW120
MW123
MW121
PW341
SW134
MW126
PW363
MW127
SW371
PW368
PW304
SW305
SW373
SW372
MW202
MW158
MW161
SW353
PW350
SW384
PW401
MW166
MW172
SW383
PW380
MW173
MW195S
MW195D
MW196
MW197
PW351
MW171
PW369
PW381
SW382
PW352
MW199
PW345
SW370
MW200
PW367
SW371
PW368
PW304
SW305
MW203
SW373
MW202
MW288
PW346
MW289
MW233
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sep-23 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.07 ug/L
0.07 to 0.7 ug/L
0.7 to 7.0 ug/L
7.0 to 70 ug/L
>70 ug/L
FIGURE 11B
1:8,000 Scale at A3
Metres
0
150
300
PFOS+PFHxS Concentrations - September 2023
2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-01-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-011B_PFOS+PFHxS_Sep23 01.mxd
Aerial Imagery Supplied by Google Earth


MW288
PW346
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW243
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MW249
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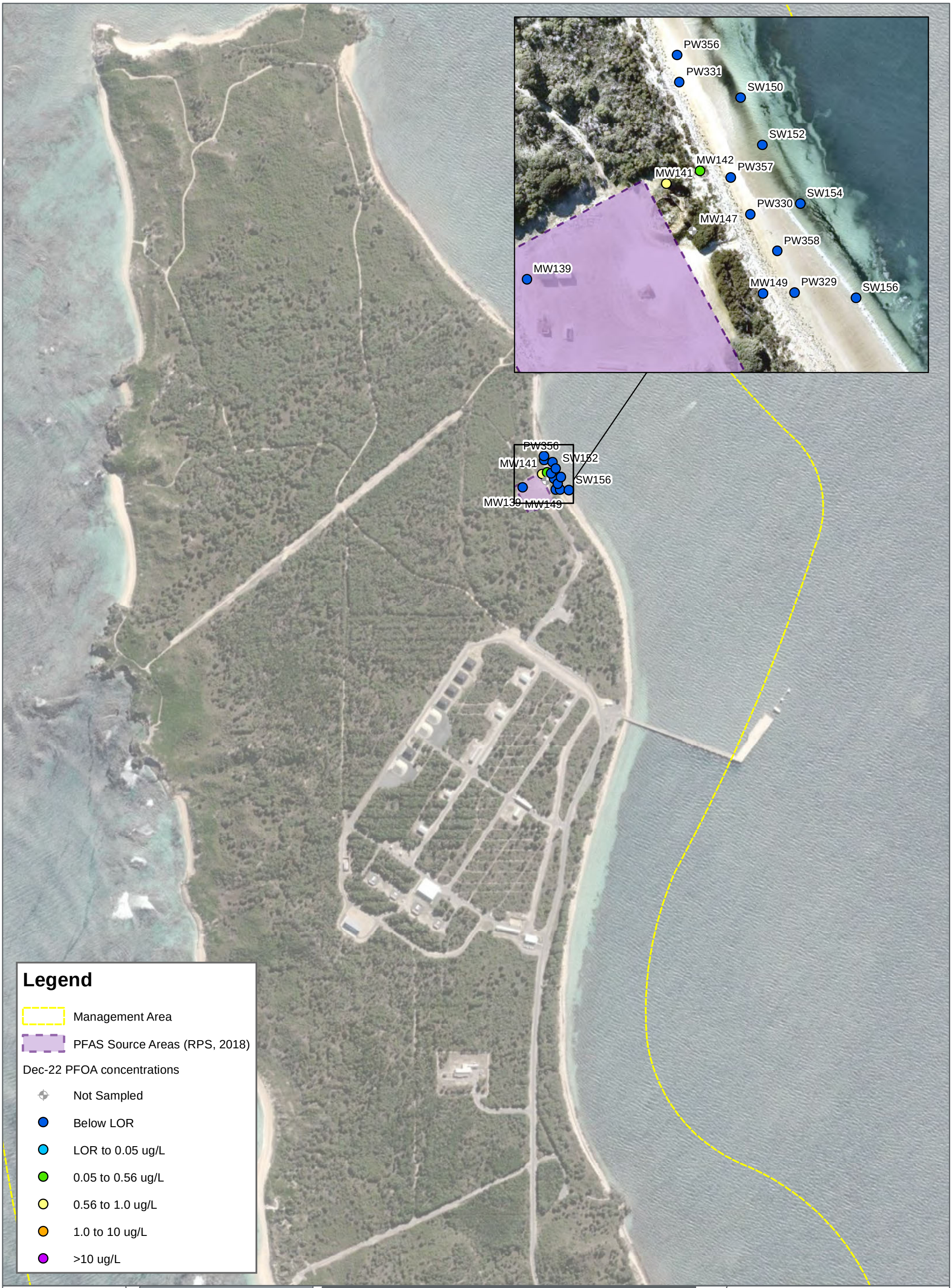
MW496
MW257
MW259
MW258
MW269
MW268
PW378
SW317
PW375
SW319
PW374
SW318
PW315
SW309
PW316
PW308
SW310
SW311
PW314
PW307
PW306
MW228
SW406
PW405
PW407
MW217
MW220
SW408
MW227
MW214
MW216
PW409
SW410
MW224
MW226
MW282
MW225
PW411
SW412
PW413
MW215
PW415
SW416
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sep-23 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.07 ug/L
0.07 to 0.7 ug/L
0.7 to 7.0 ug/L
7.0 to 70 ug/L
>70 ug/L
FIGURE 11C
1:10,000 Scale at A3
Metres
0
200
400
PFOS+PFHxS Concentrations - September 2023
2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-07-16 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-011C_PFOS+PFHxS_Sep23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap


PW356
PW331
SW150
SW152
MW142
PW357
MW141
SW154
PW330
MW147
PW358
MW139
MW149
PW329
SW156
PW356
SW152
MW141
SW156
MW139
MW149
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Dec-22 PFOA concentrations
Not Sampled
Below LOR
LOR to 0.05 ug/L
0.05 to 0.56 ug/L
0.56 to 1.0 ug/L
1.0 to 10 ug/L
>10 ug/L
FIGURE 12A
1:10,000 Scale at A3
Metres
0
200
400
PFOA Concentrations - December 2022
2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-012A_PFOA_Dec22.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

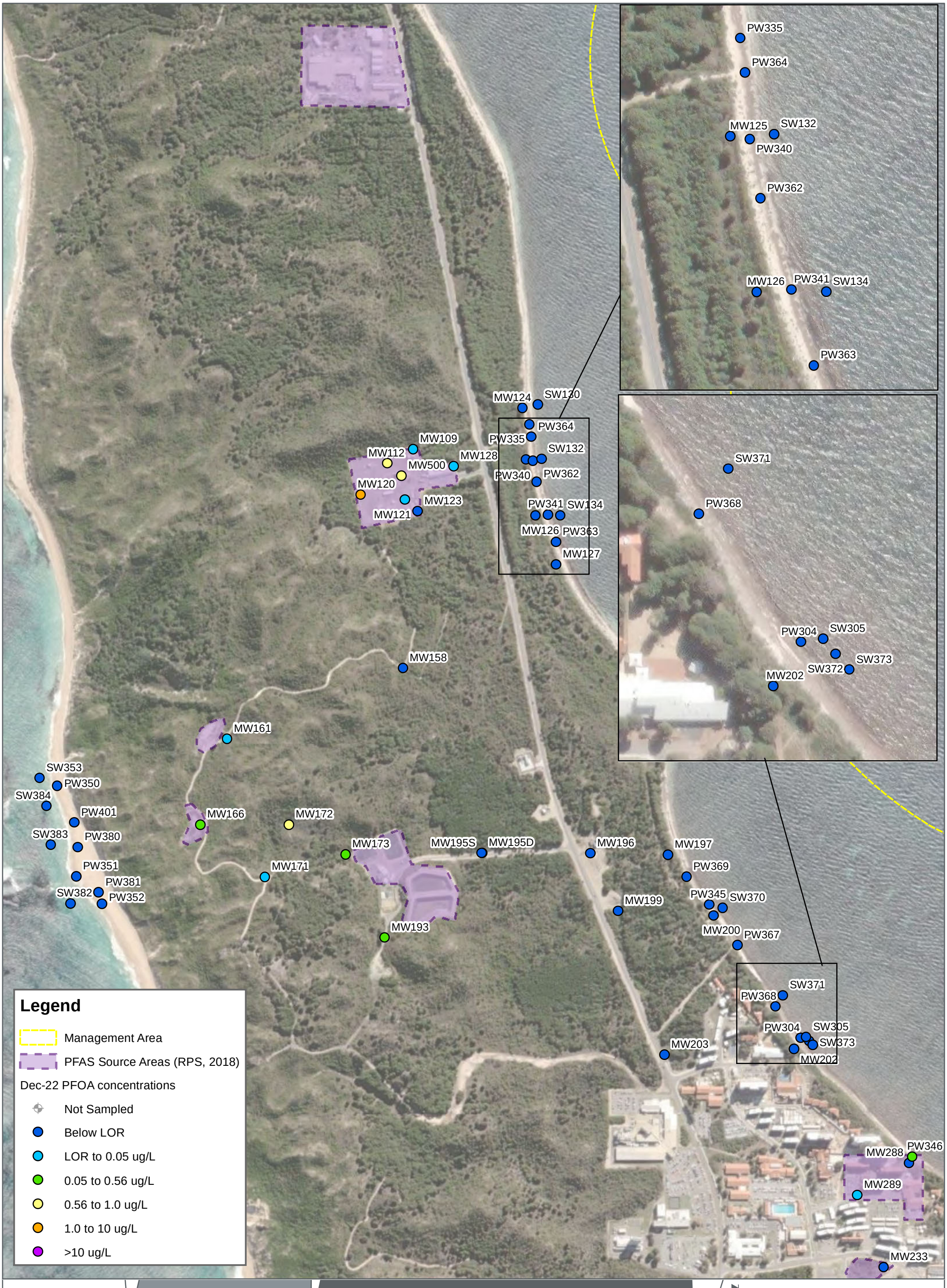


FIGURE 12B

1:8,000 Scale at A3

Metres

0 150 300

PFOA Concentrations - December 2022

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-08-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-012B_PFOA_Dec22 01.mxd
Aerial Imagery Supplied by Google Earth

MW288
PW346
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW243
MW245
MW249
MW255
MW256
MW516
MW496
MW257
MW259
MW258
MW269
MW268
PW378
SW317
PW375
SW319
PW374
MW269
MW268
PW378
SW317
PW375
SW318
SW319
PW374
MW228
SW406
PW405
PW407
MW217
MW220
SW408
MW227
MW214
MW216
PW409
SW410
MW224
MW226
MW282
MW225
PW411
SW412
MW215
PW413
PW315
SW309
PW316
PW308
SW310
SW311
PW415
SW416
PW314
PW315
PW307
PW316
SW309
SW310
PW306
PW308
SW311

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Dec-22 PFOA concentrations

- Not Sampled
- Below LOR
- LOR to 0.05 ug/L
- 0.05 to 0.56 ug/L
- 0.56 to 1.0 ug/L
- 1.0 to 10 ug/L
- >10 ug/L

FIGURE 12C

1:10,000 Scale at A3

Metres

0 200 400

PFOA Concentrations - December 2022

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-07-16 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-012C_PFOA_Dec22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

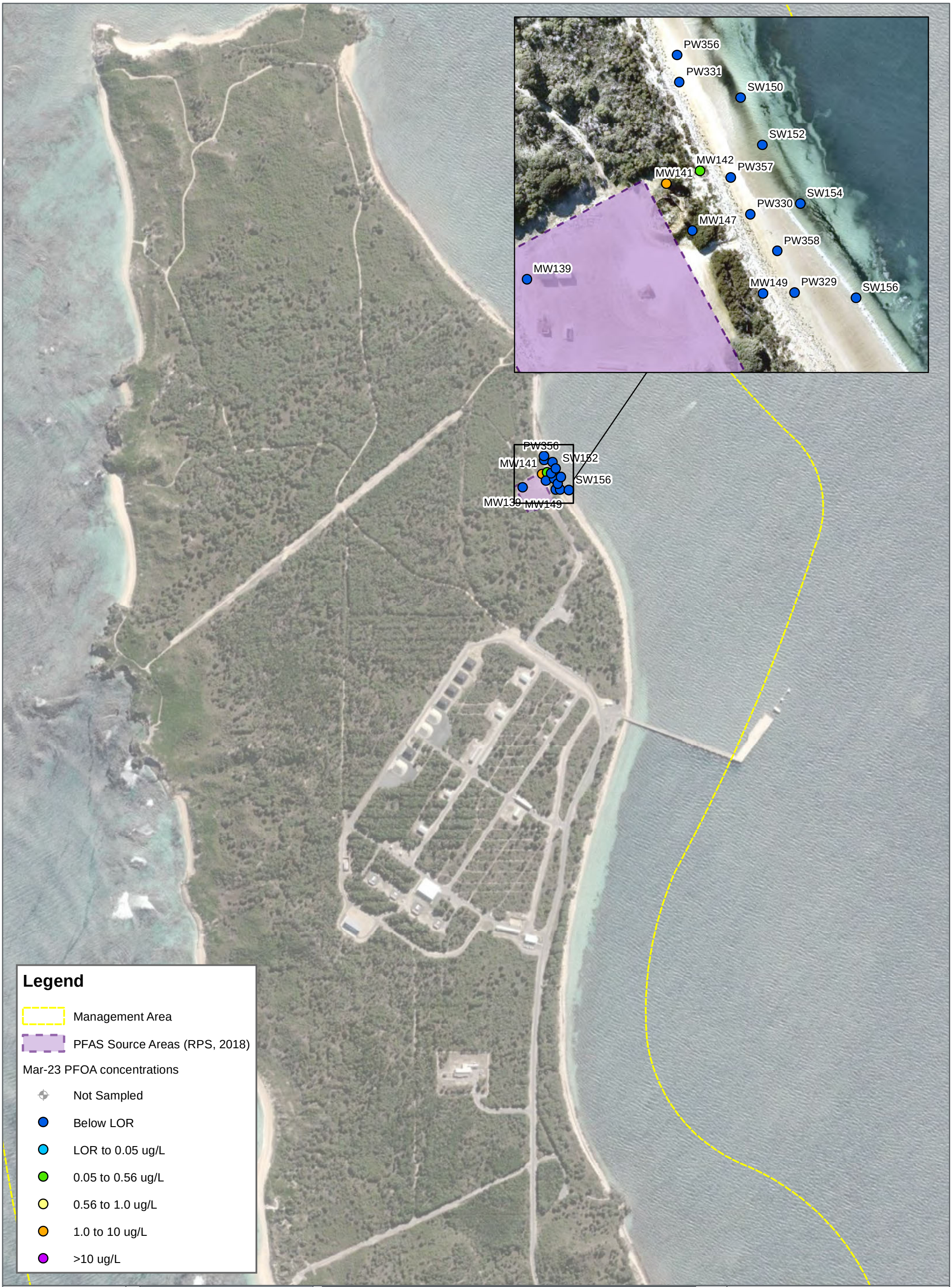


FIGURE 13A

1:10,000 Scale at A3

Metres

0 200 400

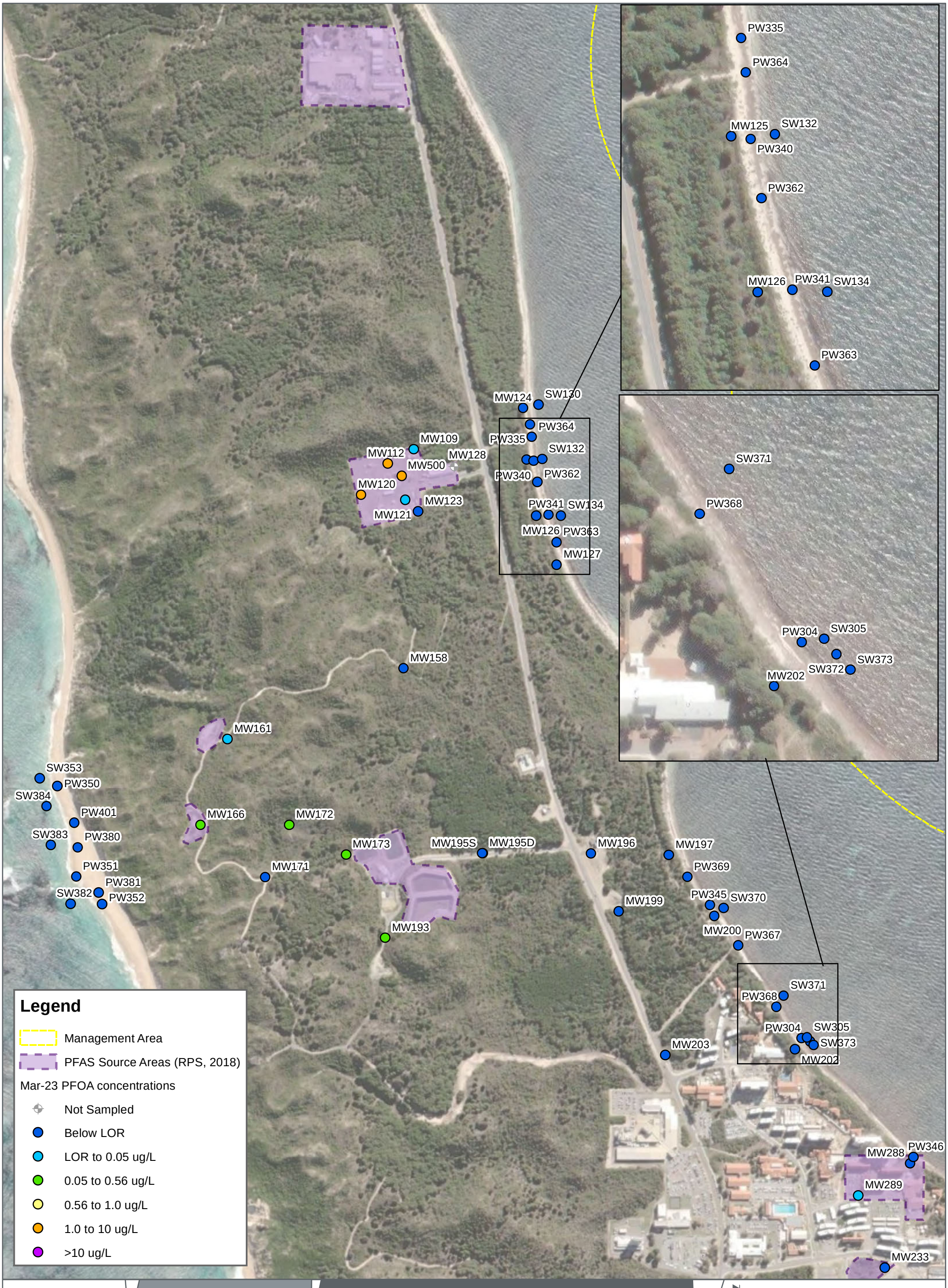
PFOA Concentrations - March 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-0013A_PFOA_Mar23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap


PW335
PW364
MW125
SW132
PW340
PW362
MW126
PW341
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PW363
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MW120
MW123
MW121
MW158
MW161
SW353
PW350
SW384
PW401
MW166
MW172
SW383
PW380
MW173
MW195S
MW195D
MW196
MW197
PW351
MW171
PW369
PW381
SW382
PW352
MW199
PW345
SW370
MW193
MW200
PW367
SW371
PW368
PW304
SW305
SW373
MW202
MW203
MW288
PW346
MW289
MW233
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Mar-23 PFOA concentrations
Not Sampled
Below LOR
LOR to 0.05 ug/L
0.05 to 0.56 ug/L
0.56 to 1.0 ug/L
1.0 to 10 ug/L
>10 ug/L
FIGURE 13B
1:8,000 Scale at A3
Metres
0
150
300
PFOA Concentrations - March 2023
2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-0013B_PFOA_Mar23 01.mxd
Aerial Imagery Supplied by Google Earth

MW288
PW346
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW243
MW245
MW249
MW255
MW256
MW516
MW496
MW257
MW259
MW258
MW269
MW268
PW378
SW317
PW375
SW319
PW374
SW318
PW228
SW406
PW405
PW407
MW217
MW220
SW408
MW227
MW214
MW216
PW409
SW410
MW224
MW226
MW282
MW225
PW411
SW412
MW215
PW413
PW315
SW309
PW316
PW308
SW310
PW415
SW416
SW311
PW314
PW307
PW306

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Mar-23 PFOA concentrations

- Not Sampled
- Below LOR
- LOR to 0.05 ug/L
- 0.05 to 0.56 ug/L
- 0.56 to 1.0 ug/L
- 1.0 to 10 ug/L
- >10 ug/L

FIGURE 13C

1:10,000 Scale at A3

Metres

0 200 400

PFOA Concentrations - March 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-07-16 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-013C_PFOA_Mar23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

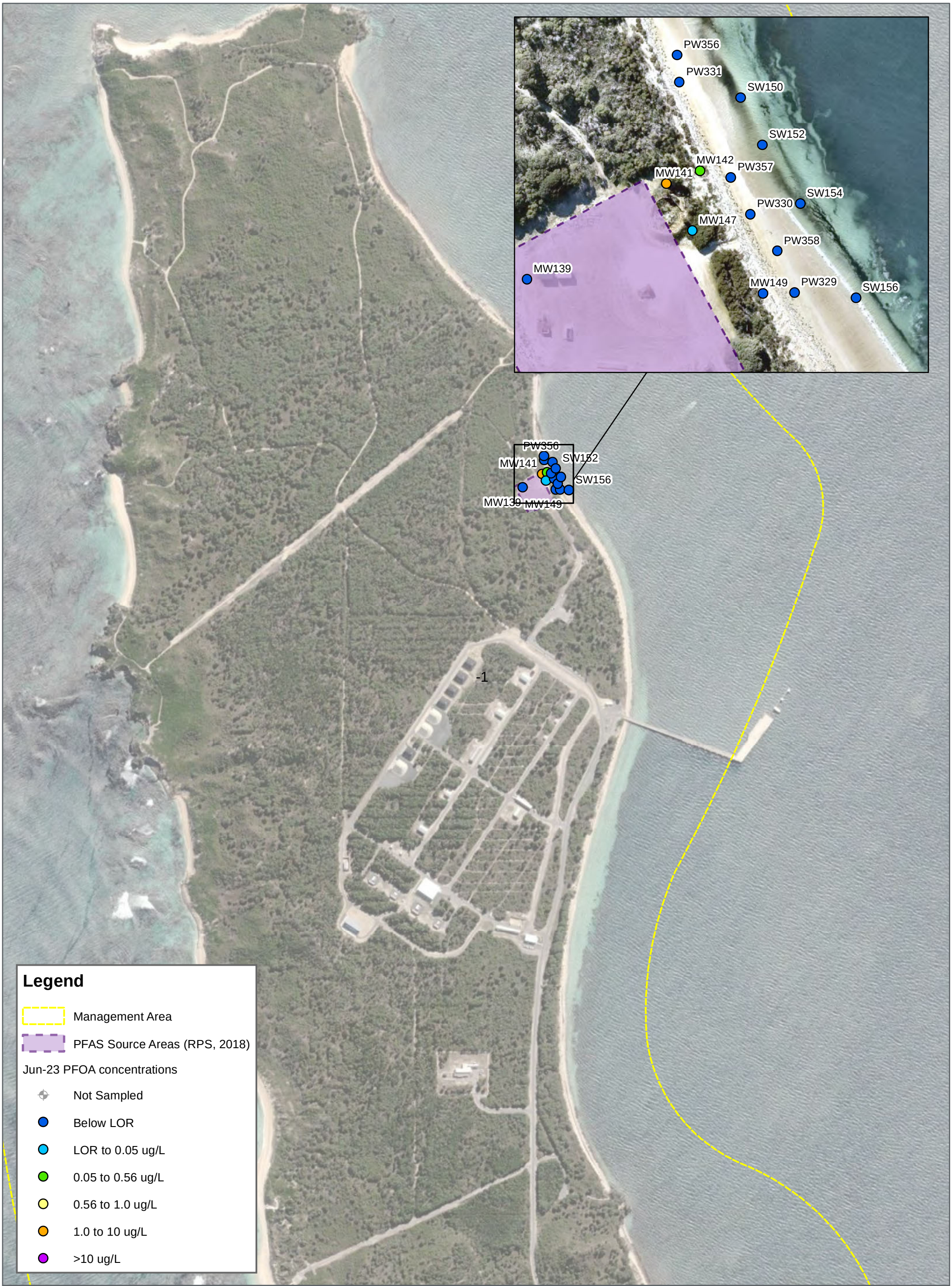

FIGURE 14A

1:10,000 Scale at A3

Metres

0 200 400

PFOA Concentrations - June 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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Cardno

Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-014A_PFOA_Jun23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

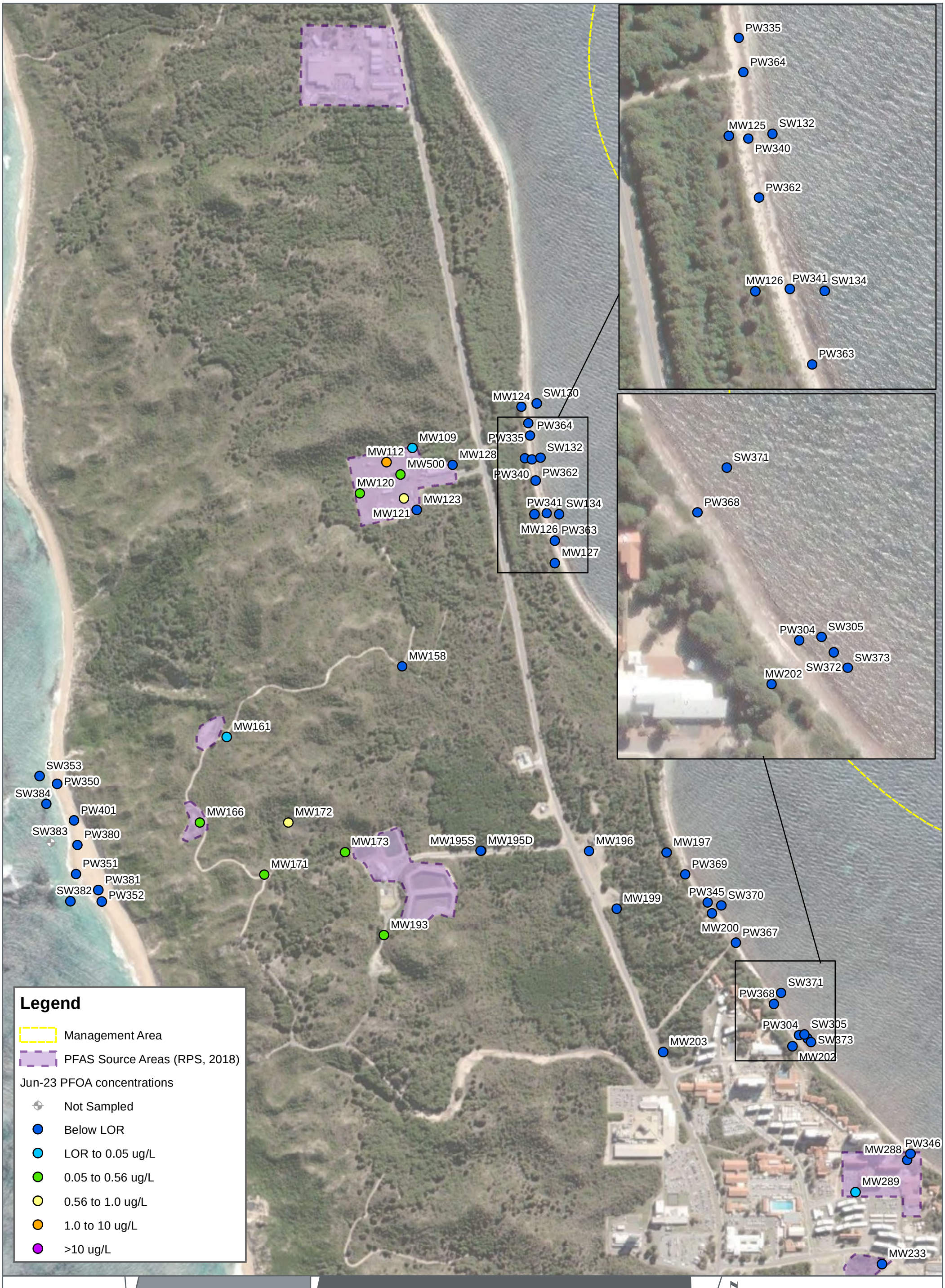


FIGURE 14B

1:8,000 Scale at A3

Metres

0 150 300

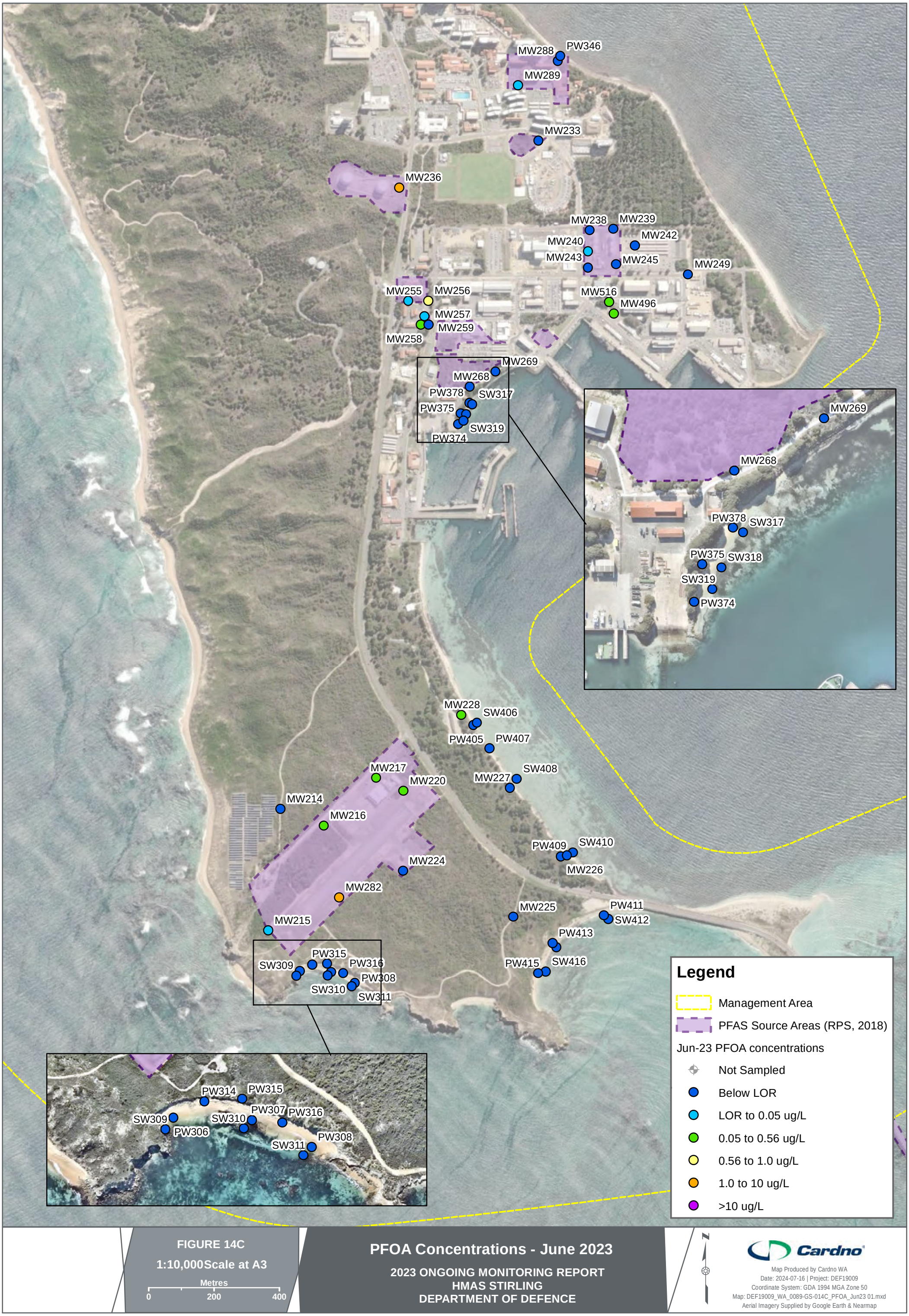
PFOA Concentrations - June 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-014B_PFOA_Jun23 01.mxd
Aerial Imagery Supplied by Google Earth


MW288
PW346
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW243
MW245
MW249
MW255
MW256
MW516
MW496
MW257
MW259
MW258
MW269
MW268
PW378
SW317
PW375
SW319
PW374
SW318
MW228
SW406
PW405
PW407
MW217
MW220
SW408
MW227
MW214
MW216
PW409
SW410
MW224
MW226
MW282
MW225
PW411
SW412
MW215
PW413
PW315
SW309
PW316
PW308
SW310
SW311
PW415
SW416
PW314
PW307
PW306
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Jun-23 PFOA concentrations
Not Sampled
Below LOR
LOR to 0.05 ug/L
0.05 to 0.56 ug/L
0.56 to 1.0 ug/L
1.0 to 10 ug/L
>10 ug/L
FIGURE 14C
1:10,000 Scale at A3
Metres
0
200
400
PFOA Concentrations - June 2023
2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-07-16 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-014C_PFOA_Jun23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

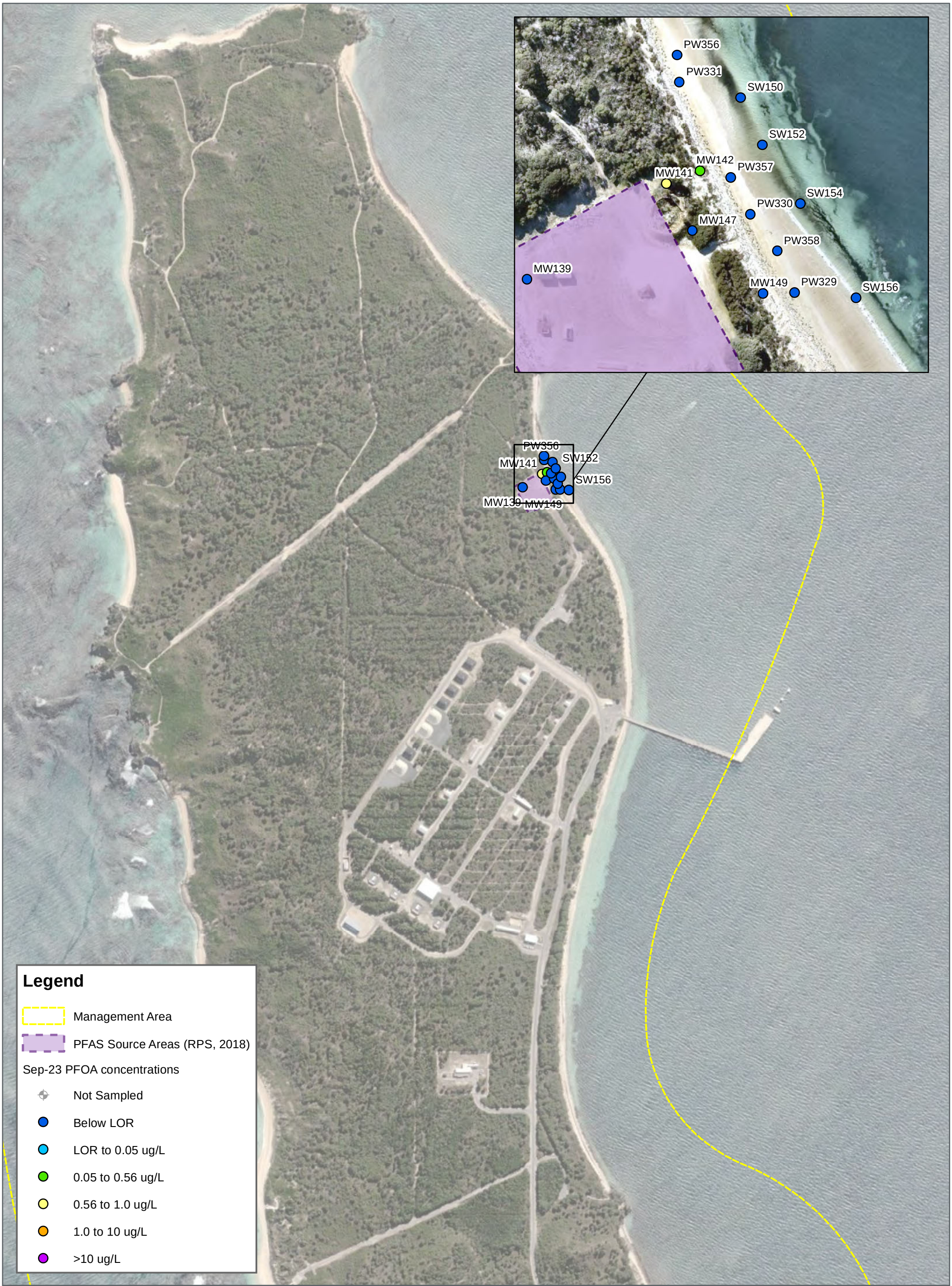


FIGURE 15A

1:10,000 Scale at A3

Metres

0 200 400

PFOA Concentrations - September 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-015A_PFOA_Sep23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

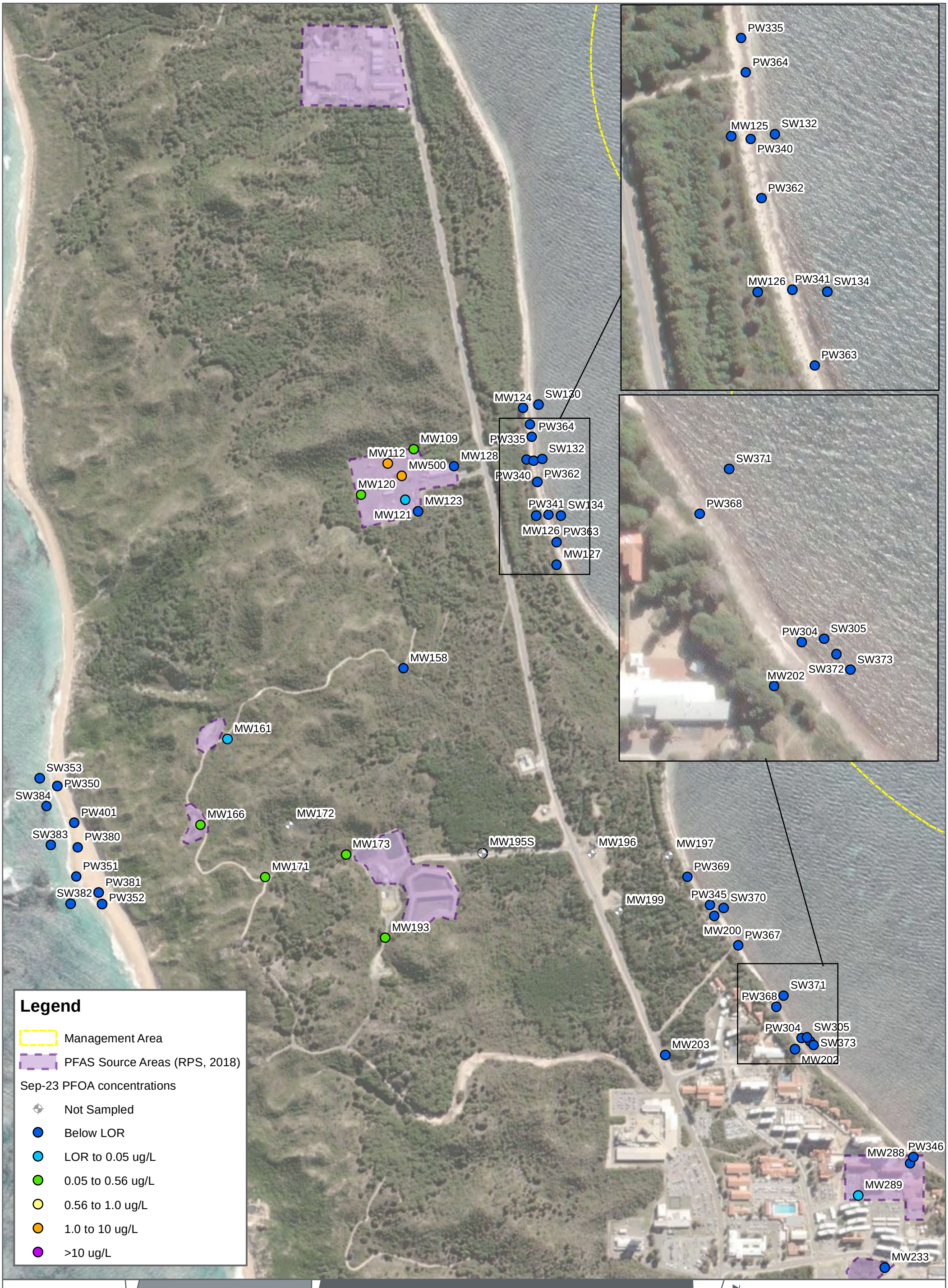


FIGURE 15B

1:8,000 Scale at A3

Metres

0 150 300

PFOA Concentrations - September 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-015B_PFOA_Sep23 01.mxd
Aerial Imagery Supplied by Google Earth

MW288
PW346
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW243
MW245
MW249
MW255
MW256
MW516
MW496
MW257
MW259
MW258
MW269
MW268
PW378
SW317
PW375
SW319
PW374
MW214
MW216
MW217
MW220
MW228
SW406
PW405
PW407
MW227
SW408
MW224
MW282
PW409
SW410
MW226
MW225
PW411
SW412
PW413
PW415
SW416
MW215
PW315
SW309
PW316
PW308
SW310
SW311
PW314
PW307
PW306

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Sep-23 PFOA concentrations

- Not Sampled
- Below LOR
- LOR to 0.05 ug/L
- 0.05 to 0.56 ug/L
- 0.56 to 1.0 ug/L
- 1.0 to 10 ug/L
- >10 ug/L

FIGURE 15C

1:10,000 Scale at A3

Metres

0 200 400

PFOA Concentrations - September 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-07-16 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-015C_PFOA_Sep23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

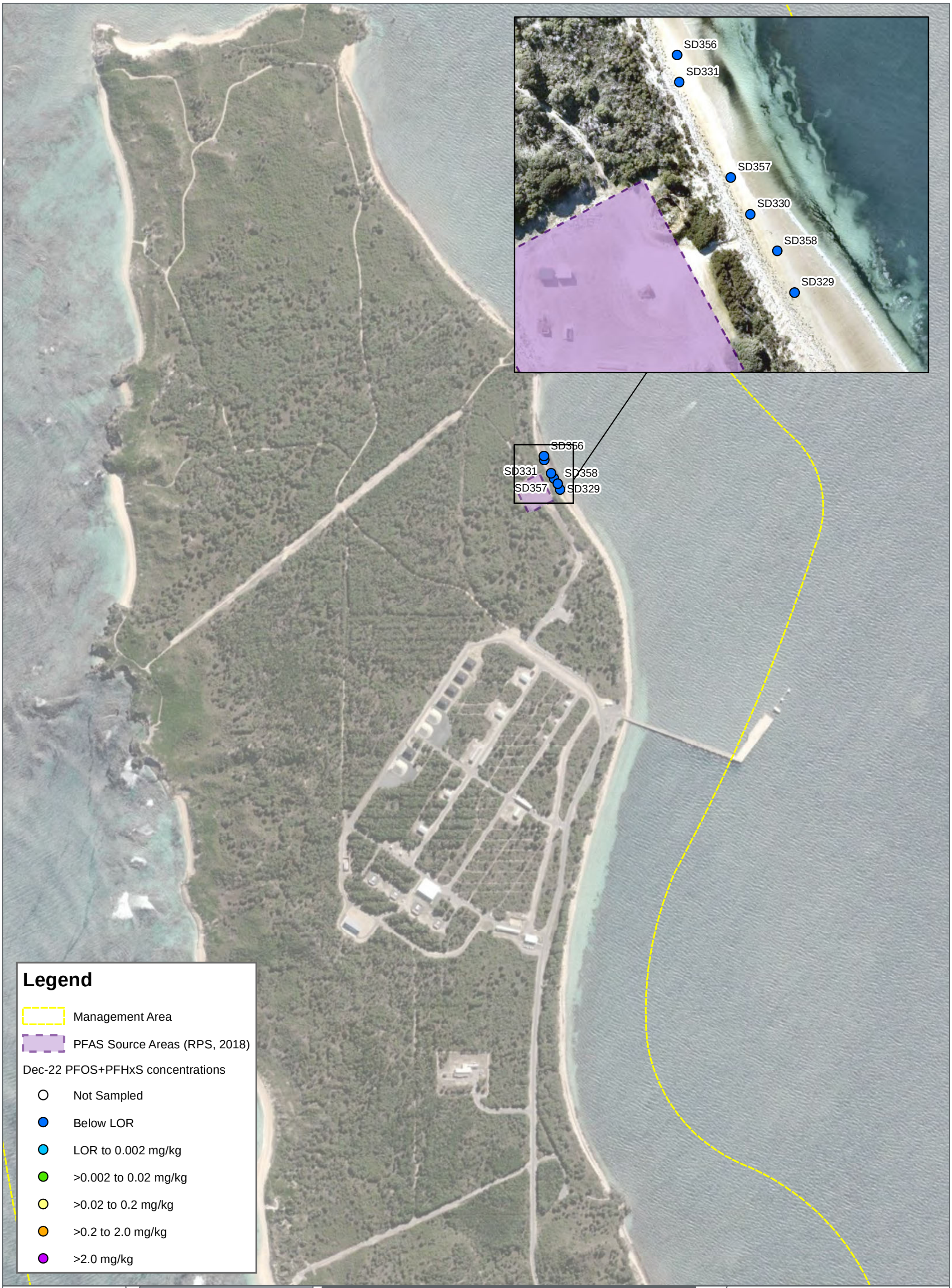


FIGURE 16A

1:10,000 Scale at A3

Metres

0 200 400

Sediment Concentrations - December 2022

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-016A_SD_Dec22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

SD335
SD364
SD340
SD362
SD341
SD363
SD368
SD304
SD350
SD401
SD380
SD351
SD381
SD352
SD369
SD345
SD367
SD346

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Dec-22 PFOS+PFHxS concentrations

- Not Sampled
- Below LOR
- LOR to 0.002 mg/kg
- >0.002 to 0.02 mg/kg
- >0.02 to 0.2 mg/kg
- >0.2 to 2.0 mg/kg
- >2.0 mg/kg

FIGURE 16B

1:8,000 Scale at A3

Metres

0 150 300

Sediment Concentrations - December 2022

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-016B_SD_Dec22 01.mxd
Aerial Imagery Supplied by Google Earth

SD346
SD378
SD375
SD374
SD405
SD407
SD409
SD411
SD413
SD415
SD314
SD315
SD316
SD308
SD306
SD307

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Dec-22 PFOS+PFHxS concentrations

- Not Sampled
- Below LOR
- LOR to 0.002 mg/kg
- >0.002 to 0.02 mg/kg
- >0.02 to 0.2 mg/kg
- >0.2 to 2.0 mg/kg
- >2.0 mg/kg

FIGURE 16C

1:10,000 Scale at A3

Metres

0 200 400

Sediment Concentrations - December 2022

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-016C_SD_Dec22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

FIGURE 17A

1:10,000 Scale at A3

Metres

0 200 400

Sediment Concentrations - March 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-017A_SD_Mar23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

SD335
SD364
SD340
SD362
SD341
SD363
SD368
SD304
SD350
SD401
SD380
SD351
SD381
SD352
SD369
SD345
SD367
SD346

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Mar-23 PFOS+PFHxS concentrations

- Not Sampled
- Below LOR
- LOR to 0.002 mg/kg
- >0.002 to 0.02 mg/kg
- >0.02 to 0.2 mg/kg
- >0.2 to 2.0 mg/kg
- >2.0 mg/kg

FIGURE 17B

1:8,000 Scale at A3

Metres

0 150 300

Sediment Concentrations - March 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-017B_SD_Mar23 01.mxd
Aerial Imagery Supplied by Google Earth

SD346
SD378
SD375
SD374
SD405
SD407
SD409
SD411
SD413
SD415
SD314
SD315
SD316
SD308
SD306
SD307

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Mar-23 PFOS+PFHxS concentrations

- Not Sampled
- Below LOR
- LOR to 0.002 mg/kg
- >0.002 to 0.02 mg/kg
- >0.02 to 0.2 mg/kg
- >0.2 to 2.0 mg/kg
- >2.0 mg/kg

FIGURE 17C

1:10,000 Scale at A3

Metres

0 200 400

Sediment Concentrations - March 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-017C_SD_Mar23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

SD356
SD331
SD357
SD330
SD358
SD329
SD356
SD331
SD358
SD357
SD329
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Jun-23 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.002 mg/kg
>0.002 to 0.02 mg/kg
>0.02 to 0.2 mg/kg
>0.2 to 2.0 mg/kg
>2.0 mg/kg
FIGURE 18A
1:10,000 Scale at A3
Metres
0
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Sediment Concentrations - June 2023
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HMAS STIRLING
DEPARTMENT OF DEFENCE
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Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Jun-23 PFOS+PFHxS concentrations

- Not Sampled
- Below LOR
- LOR to 0.002 mg/kg
- >0.002 to 0.02 mg/kg
- >0.02 to 0.2 mg/kg
- >0.2 to 2.0 mg/kg
- >2.0 mg/kg

FIGURE 18B

1:8,000 Scale at A3

Metres

0 150 300

Sediment Concentrations - June 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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Map Produced by Cardno WA
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SD307

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Jun-23 PFOS+PFHxS concentrations

- Not Sampled
- Below LOR
- LOR to 0.002 mg/kg
- >0.002 to 0.02 mg/kg
- >0.02 to 0.2 mg/kg
- >0.2 to 2.0 mg/kg
- >2.0 mg/kg

FIGURE 18C

1:10,000 Scale at A3

Metres

0 200 400

Sediment Concentrations - June 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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Map Produced by Cardno WA
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Map: DEF19009_WA_0089-GS-018C_SD_Jun23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

FIGURE 19A

1:10,000 Scale at A3

Metres

0 200 400

Sediment Concentrations - September 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-019A_SD_Sep23 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

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Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Sep-23 PFOS+PFHxS concentrations

- Not Sampled
- Below LOR
- LOR to 0.002 mg/kg
- >0.002 to 0.02 mg/kg
- >0.02 to 0.2 mg/kg
- >0.2 to 2.0 mg/kg
- >2.0 mg/kg

FIGURE 19B

1:8,000 Scale at A3

Metres

0 150 300

Sediment Concentrations - September 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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Map Produced by Cardno WA
Date: 2024-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-019B_SD_Sep23 01.mxd
Aerial Imagery Supplied by Google Earth

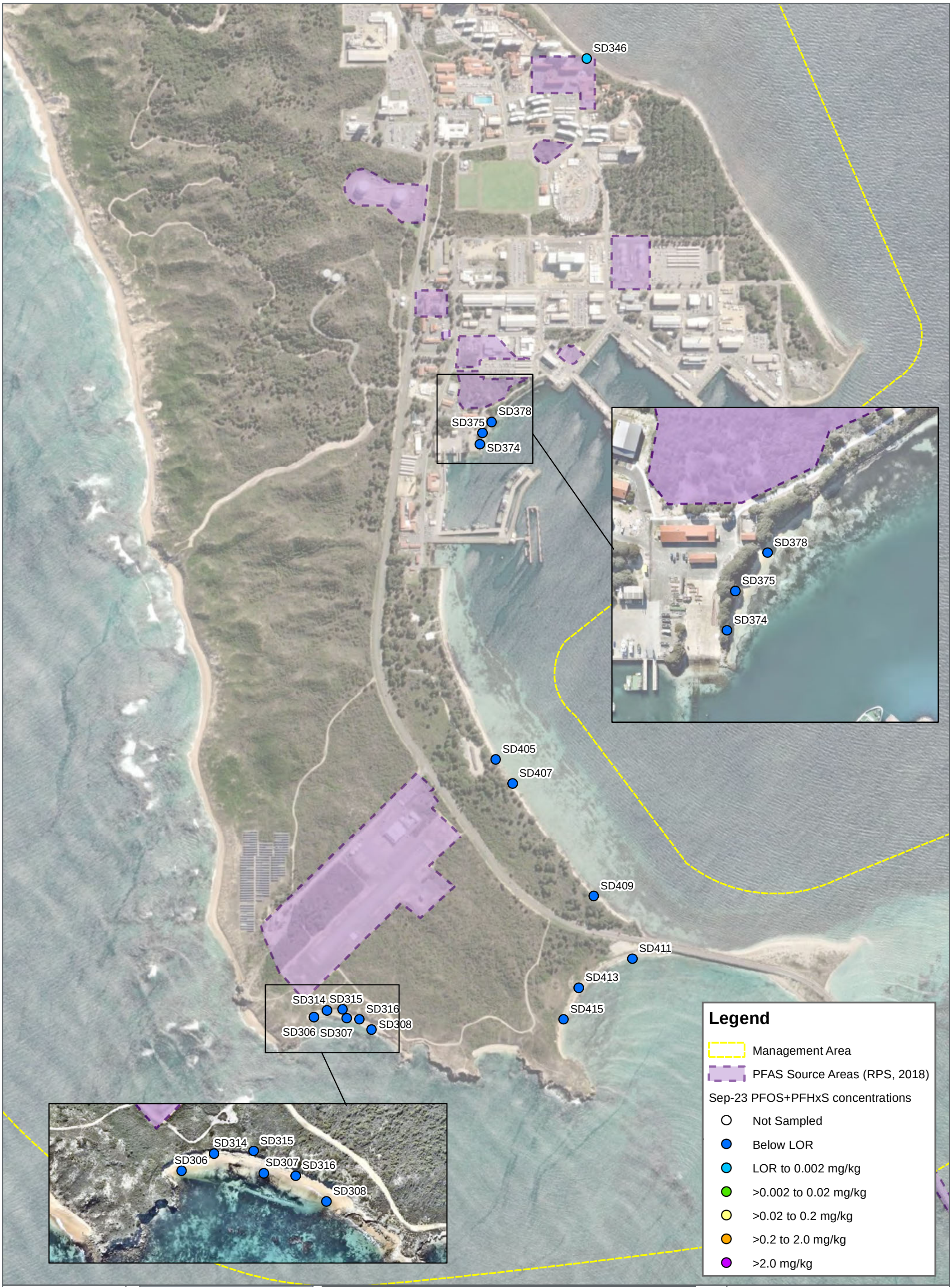

FIGURE 19C

1:10,000 Scale at A3

Metres

0 200 400

Sediment Concentrations - September 2023

2023 ONGOING MONITORING REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
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Aerial Imagery Supplied by Google Earth & Nearmap

APPENDIX

B

SAQP

Cardno

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Stantec

PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP)

HMAS Stirling

Prepared for

Department of Defence

August 23

Cardno®

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Rev 10	30 May 2023	SAQP Review	[redacted]
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1 Introduction

Cardno have been engaged by the Australian Department of Defence ('Defence' or 'Client') to prepare a Sampling and Analysis Quality Plan (SAQP) as part of the Ongoing Monitoring Plan (OMP), the purpose of which to monitor trends in the extent and concentrations of per- and poly-fluoroalkyl substances (PFAS) impacts identified on and around HMAS Stirling, located on Garden Island, 4 km off the Western Australian mainland, adjacent to the suburb of Rockingham (Figure 1, Appendix A).

The OMP SAQP applies to not only HMAS Stirling, but also the surrounding areas that, together with the Base, make up the "Management Area". For the purposes of this report:

> "the site" was defined as HMAS Stirling Garden Island (Figure 1, Appendix A).

> "the Management Area" was defined as comprising Garden Island and the marine nearshore environment (Figure 2, Appendix A).

The site is located on Commonwealth Land and is regulated under Commonwealth environmental legislation. The OMP outlines the rationale and scope for the monitoring of the concentrations and extent of PFAS in groundwater, surface water, porewater and sediment originating from the site. The monitoring frequency consists of quarterly sampling events in March, June, September, and December.

1.1 Purpose & Objectives

The objective of the OMP SAQP is to present the specific monitoring locations, sampling methodologies and quality control / quality assurance measures for the monitoring of the concentrations and extent of PFAS in groundwater, surface water, porewater and sediment originating from the site. These findings will inform risk management decisions by Defence and the Western Australian Government to protect human health and the environment.

The specific purposes of the monitoring specified in the OMP is to:

1. Evaluate change the nature and extent (spatial and temporal) of PFAS impact in groundwater, porewater and surface water pathways associated with site sources of PFAS derived from legacy use of AFFF;
2. Monitor the migration of PFAS in groundwater, porewater, sediment and surface water from the site;
3. Provide confirmation of the current understanding of risk; and
4. Provide supporting data for assessment of management actions, where relevant.

1.2 Previous Reports

The following key reports prepared in relation to the HMAS Stirling PFAS Investigation have been used as a basis to develop this SAQP:

> Department of Defence, January 2019, *HMAS Stirling Garden Island PFAS Management Area Plan*, Final.

> RPS, October 2018, *HMAS Stirling - PFAS Ongoing Monitoring Plan*, Ref. EEC16094.005 (RPS, 2018a).

> RPS, May 2018, *Detailed Site Investigation – HMAS Stirling PFAS Investigation*, Ref. EEC16094.003 (RPS, 2018b).

> RPS, September 2018, *HMAS Stirling Garden Island PFAS Investigation Ecological Risk Assessment*. Ref. EEC16094.009 (RPS, 2018c).

> Cardno, 16 April 2020, *PFAS OMP 2019 Q4 Quarterly Monitoring Factual Report, HMAS Stirling*.

> Cardno, 14 May 2020, *PFAS OMP 2020 Q1 Quarterly Sampling Event Factual Report, HMAS Stirling*.

> Cardno, 23 September 2020, *PFAS OMP 2020 Q2 Quarterly Sampling Event Factual Report, HMAS Stirling*.

> Cardno, 8 January 2020, *PFAS OMP 2020 Q3 Quarterly Sampling Event Factual Report, HMAS Stirling*.

> Cardno, 4 May 2021, *PFAS OMP 2020 Q4 Quarterly Sampling Event Factual Report, HMAS Stirling*.

- Cardno, 15 June 2021, *PFAS OMP 2021 Q1 Quarterly Sampling Event Factual Report, HMAS Stirling*.
- Cardno, 16 September 2021, *PFAS OMP 2020 Annual Interpretive Report, HMAS Stirling*.
- Cardno, 5 August 2021, *PFAS OMP 2021 Q2 Quarterly Sampling Event Factual Report, HMAS Stirling*.
- Cardno, 18 November 2021, *PFAS OMP 2021 Q3 Quarterly Sampling Event Factual Report, HMAS Stirling*.
- Cardno, 12 April 2022, *PFAS OMP 2021 Q4 Quarterly Sampling Event Factual Report, HMAS Stirling*.
- Cardno, 3 August 2022, *PFAS OMP 2022 Q1 Quarterly Sampling Event Factual Report, HMAS Stirling*.
- Cardno, 13 October 2022, *PFAS OMP 2022 Q2 Quarterly Sampling Event Factual Report, HMAS Stirling*.
- Cardno, 9 December 2022, *PFAS OMP – 2021 Annual Interpretive Report, HMAS Stirling.*
- Cardno, 22 December 2022, *PFAS OMP 2022 Q3 Quarterly Sampling Event Factual Report, HMAS Stirling*.
- Cardno, 24 February 2023, *PFAS OMP 2022 Q4 Quarterly Sampling Event Factual Report, HMAS Stirling*.
- Cardno, 2023, draft *PFAS OMP – 2022 Annual Interpretive Report, HMAS Stirling*.
- Cardno, 9 May 2023, *PFAS OMP 2023 Q1 Quarterly Sampling Event Factual Report, HMAS Stirling*.
- Cardno, 11 August 2023, *PFAS OMP 2023 Q2 Quarterly Sampling Event Factual Report, HMAS Stirling*.

1.3 Responsible Parties

Responsible parties and responsibilities associated with the implementation of the OMP are detailed in Table 1-1.

Table 1-1 Responsible Parties

Role	Responsibilities
Department of Defence – PFAS Investigation and Management Branch	▪ Implement this OMP. ▪ Engage suitably qualified environmental consultants/contractors to carry out the works specified in the OMP
HMAS Stirling – Base Support Manager/ and Environment and Sustainability Manager	▪ Review and approve all necessary permits required for implementation of the works outlined in the OMP.
Environmental Consultant	▪ Obtain necessary permits from HMAS Stirling to implement the works outlined in the OMP. ▪ Undertake the monitoring activities outlined in this SAQP. ▪ Produce a monitoring report that summarises the data and findings of each monitoring event and is consistent with the requirements of this SAQP. ▪ Produce an annual interpretative report including recommendations for any potential changes in the location and frequency of sampling which may be incorporated in the revision of the OMP. ▪ Upload analytical data from each monitoring event to the relevant Defence ESdat database.

1.4 Relevant Guidelines

This SAQP has been prepared in general accordance with the WA *Contaminated Sites Act 2003* (CS Act), applicable industry standards and guidelines relevant to an assessment of this type, and has been formulated in reference to the following:

- National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure (as amended 2013)* (ASC NEPM).
- Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, *PFAS National Environmental Management Plan 2.0 (NEMP)*.

- Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds*.
- Australian Standard AS 4482-1999 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 2 - Volatile substances*.
- Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling*.
- Australian and New Zealand Guidelines, 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.*
- Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.
- U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*.
- USEPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8).*
- Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*[1].
- National Health and Medical Research Council (NHMRC), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

1.5 Standards of Assessment and Limitations

This SAQP has been prepared in general accordance with the current industry standards for an assessment of this type for the purpose, objectives and scope identified in this report.

The scope presented in this SAQP report are derived only from available desk-based information and site inspection undertaken. This SAQP is not any of the following:

- A Mandatory Audit Report (MAR) or Voluntary Audit Report (VAR) as defined under the *Contaminated Sites Act 2003* (CS Act).
- A Geotechnical Assessment.
- A Detailed Site Investigation (DSI).
- A Detailed Hydrogeological Assessment.
- A Remediation Action Plan (RAP) or Site Remediation & Validation (SRV) report.
- A Site Management Plan (SMP).

[1] It is noted that Site is located on Commonwealth Land and is regulated under the Commonwealth environmental legislation, the State based DWER guidelines are relevant for the sampling of off-Site nearshore marine environment.

2 Site Description and Management Areas

HMAS Stirling is located on Garden Island within Cockburn Sound, situated approximately 4 km off the WA mainland and connected to the mainland via a bridge in the south of the Island. The Island is 12 km long and 1.5 km wide at its widest point and covers an area of 1,274 hectares (ha).

Defence facilities occupy approximately 28% of the Island, with the majority focused around Careening Bay on the southeast, with other support facilities located in other portions of the Island.

The Island is divided into eight administration areas:

> Causeway Sector
> Helicopter Support Sector
> Beagle Road Sector
> Careening Bay Sector
> Torpedo Maintenance Sector
> Fireground Sector
> RANAWED Sector
> Herring Bay Sector

The buildings and associated infrastructure and support services include:

> Accommodation blocks
> Helicopter Support Facility
> Fire Station
> Fuel Farm
> Flammable / Hazardous goods and waste Storage
> AVCAT Storage Facility
> Wastewater Treatment Plant (WWTP)
> Seepage ponds
> Shipping berths and ship sullage area
> Maintenance and workshop areas
> Demolition ground
> Fire Training area

2.1 Site Definition and Planning

The site location is presented on Figure 1, Appendix A. Key site identification details are presented in Table 2-1.

Table 2-1 Site Identification Details

Details	Description
Site Address	Garden Island, WA
Land Description	HMAS Stirling
Owner	Commonwealth of Australia
Title Details	Lot 9 on Plan 226190
Planning Zone / Land use	Naval Development
Local Government Authority (LGA)	City of Rockingham

2.2 Surrounding Land Uses and Zoning

Cockburn Sound is used for a variety of activities both commercial and recreational including:

> Fishing

> Water sports

> Shipping

Kwinana Industrial Area is located immediately opposite Garden Island on the mainland side of Cockburn Sound. Activities occurring in the Kwinana Industrial Area include:

> Petroleum products

> Fertiliser production

> Chemical production

> Cement production

> Bulk material handling

> Metal refining

> Waste management

> Kwinana Power Station

3 Environmental Setting

Key details defining the site are summarised in Table 3-1.

Table 3-1 Key Site Details

Setting	Description
Climate	The Perth region, including Garden Island has a warm summer, cold winter Mediterranean climate. Mean maximum temperatures on the Island occur in February (28.3 ºC) while mean minimum temperatures occur in July (11.2 ºC). Rainfall is winter dominant, with the highest volume of rainfall typically occurring in July with a mean monthly rainfall amount of 115.5 mm.
Topography	Topography on Garden Island ranges from sea level, 0 meters relative to the Australian Height Datum (m AHD) along the eastern coast line to 55 mAHD within the middle of the Island. Steep dunes and limestone cliffs of up to 10 mAHD characterise the western perimeter of the Island, whilst the eastern perimeter is relatively flat.
Acid Sulfate Soil	A review of the Acid Sulfate Soils (ASS) risk mapping, available on the WA Atlas online database indicates no known risk of ASS occurrence within three meters of natural ground surface for the site.
Hydrology	There are no natural surface water bodies on the Island, with any stormwater falling outside developed areas anticipated to infiltrate directly into the sandy soils and into the underlying superficial aquifer. Garden Island is surrounded by the Indian Ocean and the Cockburn Sound. Groundwater (and potentially PFAS) leakage between the superficial and deeper aquifers is unlikely at the northern half of Garden Island due to the presence of the Kardinya Shale confining unit. However, there is potential for groundwater and PFAS leakage between the superficial aquifer and underlying Rockingham Sand at the southern half of the Island where the Kardinya Shale is not present (RPS, 2018b).
Geology	**Regional Geology** Garden Island is an offshore outcrop of Tamala Limestone and part of the Garden Island Ridge, the WA Department of Mines and Petroleum 1:50,000 geological map series indicates the surface is Calcareous Sand (S2 and S13) (i.e. Safety Bay Sand – white medium grained rounded quartz and shell debris well sorted of eolian origin). **Site Specific Geology** Logs from the drilling of groundwater wells and soil cores during previous sampling programs (ENSR 2009, RPS 2018) indicate the geology of the site varies with topography. The Demolition Ground in the north coast of the Island contains Safety Bay Sand to at least 5 meters below ground level (mbgl), and at the WWTP Safety Bay Sands were encountered down to 29 mbgl. Layers of limestone were encountered in certain areas (e.g. Fire Training Area at 1-2 mbgl and around the WWTP at 7-15 mbgl). Fill sands containing brick rubble and limestone cobbles were also encountered in the Fire Training Area to a depth of 1 mbgl.
Hydrogeology	▪ **Groundwater Occurrence** – The superficial aquifer at Garden Island, whilst geologically connected, is not hydraulically connected to the superficial aquifer of the mainland as both discharge to the near shore marine environment. The underlying confined aquifers, the Leederville and deeper Yarragadee, typically extend tens of kilometres offshore beneath the seabed and are thought to discharge terrestrial groundwater to the ocean several kilometres from the coast (Davidson, 1995). At the South of the Island the superficial aquifer extends to a depth of around 20 mbgl, with an aquitard (Kings Park Formation) at ~90 mbgl, overlying the Kardinya Shale around 140 mbgl, overlying the Leederville aquifer at ~165 mbgl. In the north of the Island, the Kardinya Shale is present at significantly shallower depth than in the south (~37 mbgl) and forms an aquitard to the deeper Leederville Formation at ~181 mbgl. ▪ **Depth to Groundwater** – The depth to groundwater is affected by the topography of the Island. Along the coast line groundwater is found at shallow depth (2-3 mbgl), whilst around the WWTP groundwater is up to 21 mbgl. The depth to groundwater, especially along the coastal fringes, will be influenced by tides within the surrounding marine environment.

Setting	Description
	▪ **Groundwater Flow Direction** – Regional groundwater flow direction are anticipated to be towards the marine environment, with flow on the east of the dunal system towards Cockburn Sound and flow towards the Indian Ocean on the west of the dunal system. Tidal pressure can influence localised flow direction in the vicinity of the coastline. **Salinity** – The superficial groundwater is classified as brackish by the DWER Perth Groundwater Atlas, with a total dissolved solids (TDS) in the range of 500 – 1,000 mg/L. ▪ **Groundwater Use** – Groundwater is not abstracted on the Island for potable or non-potable use. Potable water for Garden Island is supplied from the Rockingham town water supply. The DWER groundwater database found two registered abstraction bores (Leederville Aquifer) on the mainland within 20 km of Garden Island. These bores are used for irrigation and industry. RPS ruled out any risk of PFAS impact to these bores according to the calculated groundwater travel time (RPS, 2018b).
Environmental Sensitive Areas	Due to its significant natural and cultural heritage values, the Island is protected by the *Environment Protection and Biodiversity Act 1999* (EPBC Act). Several vulnerable species of flora have also been listed as endangered ecological communities. The vegetation on the Island is also included in Bush Forever Site 63, with the Bush Forever policy providing a framework for bushland protection and management issues in WA. Additionally, the seagrass meadows along the eastern margin of Garden Island are a significant remnant population of seagrass in Cockburn Sound and are protected under the *State Environmental (Cockburn Sound) Policy 2015*.
Further information can be found in the Consolidated DSI report (RPS, 2018b).	

4 Source Areas and Risk

The site has been subject of previous PFAS investigations, including:

> *Environmental Review of Fire Fighting Training and Facilities* (AURECON, 2010)

> *Environmental Investigation of AFFF Spill at Fleet Base West, Preliminary Site Investigation* (AECOM, 2012)

> *Defence Per- and Poly-fluoroalkyl Substances (PFAS) Environmental Management Preliminary Sampling Program* (GHD, 2016)

> *Stage 2 Detailed Site Investigation* (Greencap, 2017)

> *Sampling and Analysis Quality Plan HMAS Stirling – PFAS Investigation* (RPS, 2017)

> *Detailed Site Investigation – HMAS Stirling PFAS Investigation* (RPS, 2018b)

> *Ecological Risk assessment, HMAS Stirling – PFAS Investigation* (RPS, 2018c).

4.1 Source Areas

Various PFAS source areas across the Island were identified resulting from historical AFFF use/storage. These locations are shown on Figure 2, Appendix A and include:

> Fire training area

> Helicopter support facility

> Demolition ground

> Wastewater treatment plant (WWTP)

> AVCAT storage, fuel farm and infiltration swale

> Fire station

> Dredged sediments

> Ship sullage area

> Flammable/hazardous goods and waste storage

> Accommodation area.

The results of the DSI (RPS, 2018b) indicate that PFAS was identified in all assessed matrices (soil, groundwater, surface water, sediment and porewater) in at least one location on the Island.

5 Data Quality Objectives

Development of data quality objectives (DQOs) for the OMP SAQP is based on guidance presented in The ASC NEPM (NEPC 2013) and are consistent with the HMAS Stirling PFAS Ongoing Monitoring Plan presented in the PMAP (Defence 2019). The DQO process comprises the following seven steps:

> Step 1: State the problem

> Step 2: Identify the decision/principal study question(s)

> Step 3: Identify the Inputs into the Decision

> Step 4: Study Boundaries

> Step 5: Decision rules

> Step 6: Tolerable limits on decision errors

> Step 7: Optimisation of the data collection process

The DQOs are detailed in Table 5-1.

Table 5-1 Data Quality Objectives

Data Quality Step	Description
State the Problem	Sampling and analysis completed as part of the DSI (RPS, 2018b) and ERA (RPS, 2018c) conducted at the site have identified concentrations of PFAS in soils, sediments, groundwater, surface water and porewater resulting from historical use of AFFF on Garden Island. The DSI and ERA confirmed that there is no significant risk from the identified PFAS concentrations to human health or ecological receptors. To confirm the current understanding of risk identified in DSI/ERA investigations, quarterly monitoring is required which will provide confirmation of PFAS concentrations allowing for seasonal variability. **Groundwater** ▪ PFAS were detected above the LOR within all wells at the fire training area, the WWTP and the demolition ground (RPS, 2018b) with exceedances of adopted guidelines observed. ▪ Exceedances of the guidelines adopted to be protective of human health were observed in groundwater. The human health risk is generally considered to be low in regards to the groundwater uses however, there remains a potential risk to maintenance/construction workers. **Surface Water** ▪ Surface water concentrations are above adopted guidelines along the coastline, at the Demolition Ground, WWTP, and Helicopter Support Facility and as such may pose a risk to marine ecological receptors. ▪ Although recreational fishing and shell fishing may be undertaken on a limited basis around the Island, there is limited potential for dietary ingestion of PFAS to be a significant pathway due to the low levels of PFAS detected in marine sediment and surface water. **Sediment and Porewater** ▪ Soils at the Fire Training Area, Helicopter Support Facility and Fire Station pose a risk to the local ecology via direct contact to organisms, plant and fauna. The risk posed by soils to the local marine ecology was considered to be low. ▪ Sediments at the Fire Station were found to contain PFOS above the adopted assessment levels which may act as a source for the migration of PFAS to groundwater and the subsequent lateral migration to marine sediments, porewater and surface waters. ▪ Whilst there are no current pore water guidelines, concentrations within pore water were above adopted groundwater and surface water guidelines at the demolition ground, WWTP and dredged sediment areas. Groundwater may transport PFAS into coastal marine environments where it mixes with the sediments pore water. PFAS

Data Quality Step	Description
	concentrations in pore water above adopted ecological guidelines pose a risk from bioaccumulation and biomagnification. Most of the sampling locations (groundwater, surface water, and sediment sampled as part of the DSI) have only been tested once or twice (i.e. limited time series/seasonal data). A robust dataset is required to assess trends in the nature, extent and magnitude of PFAS concentrations within sediment, surface water and groundwater to validate/improve the understanding of the CSM in relation to spatial and temporal variability of PFAS concentrations within the Management Area and associated receptors.
Identify the decision/principal study question(s)	This OMP is to provide further data to assess the following principal study questions: ▪ What are the changes and trends in the nature, extent and magnitude of PFAS concentrations in the groundwater, surface water and sediment within the Management Area? ▪ Has the nature, extent and magnitude of PFAS concentrations changed significantly to warrant a revision of the ERA? ▪ Has the nature, extent and magnitude of PFAS concentrations changed significantly to warrant refinement of any existing management measures? ▪ Has the nature, extent and magnitude of PFAS concentrations changed significantly or are they likely to change?
Identify the Inputs into the Decision	The following inputs are required to resolve the principal study questions outlined in Step 2: ▪ PFAS concentrations in groundwater, surface water, porewater and sediment from previous and future monitoring events. ▪ Field data (i.e. groundwater levels, physico-chemical parameters) on groundwater, porewater and surface water from previous and future monitoring events. ▪ An appropriate statistical evaluation of the data (e.g. using Mann-Kendall or similar analysis) including short- and long-term trends, in particular for surface water and groundwater concentrations. ▪ Comparison of data sets to relevant endorsed assessment levels (refer to Section 7).
Study Boundaries	Ongoing monitoring will be undertaken within the boundaries of the Management Area (Figure 2, Appendix A) at the groundwater, surface water, porewater and sediment monitoring locations outlined in Sections 6.3.1 and 6.4.1. Monitoring will be undertaken every three months, with one monitoring event in March, June, September and December. Section 6 provides further detail on the monitoring frequency.
Develop a Decision Rule	▪ The analytical and field data will be used to assess changes to the nature, extent and magnitude of PFAS in surface water, sediment and groundwater and to provide supporting data for assessment of management actions, where relevant. ▪ Trends in PFAS concentrations, including an assessment of temporal and spatial changes, will be assessed using an appropriate statistical analysis approach (e.g. using Mann- Kendall, GWSdat or similar analysis), with a specified level of confidence based upon the number of monitoring rounds completed. ▪ The analytical data will be compared to the relevant assessment levels (presented in Section 7) and/or historic concentrations (i.e. maximum concentration) recorded during prior monitoring rounds [i.e. during the DSI (RPS, 2018b)] to evaluate changes in the risk profile and whether revision of the OMP, ERA or implemented management measures is warranted. Where exceedances of adopted assessment criteria levels (presented in Section 7) or new detections are reported, further interrogation of data will be undertaken to the extent relevant to assess the risk profile and location. A summary of the key decision rules as detailed below: 1. Have the analytical data collected as part of the monitoring program met the DQI (refer Table 5-2.below)? If yes, then the data can be used to answer the decision rule below and the decision statements developed in Step 2. If no, then an assessment of the need to collect additional data will be required. 2. Do PFAS concentrations exceed the investigation criteria? If no, then the contamination would be considered not to pose an unacceptable risk. Where results

Data Quality Step	Description
	exceed the adopted investigation criteria, this may not necessarily indicate an unacceptable level of risk. Further risk assessment, and potentially additional investigations, will be required to determine the potential for unacceptable impacts. 3. Has PFAS been detected in any bores previously not detected? If yes, do PFAS concentrations reported indicate an increasing trend and/or exceed historic maximum concentrations? Do results indicate a potential risk to associated receptors including associated risks that PFAS may present towards receptors (i.e. human and ecological). Further risk assessment, and potentially additional investigations, will be required to determine the potential for unacceptable impacts. 4. Has PFAS been detected in offsite surface water bodies within the management areas? If yes, do PFAS concentrations reported indicate an increasing trend or exceed historic maximum concentrations? Do results indicate a potential risk to receptors and changes to the risk profile? Further risk assessment, and potentially additional investigations, will be required to determine the potential for unacceptable impacts. Annual Interpretative Report will review the results obtained against these triggers/decisions.
Specify Limits on Decision Error	The potential for significant decision errors will be minimised by completing a robust QA/QC program in accordance with DWER and NEPM guideline requirements. Standard operating procedures will be closely followed in the field to ensure accurate and representative data acquisition. DQIs will be applied to assess usability of data prior to making decisions, based on precision, accuracy, representativeness, comparability and completeness. The acceptable limit on decision error is 95% compliance with the applied DQIs (see Table 5-2). If any of the DQIs are not met, further assessment will be necessary to evaluate the significance of the non- conformance and any corrective actions.
Optimise the Design for Obtaining the Data	The design of the OMP has been made in consideration of historical activities at the site, historical investigations (and findings i.e. DSI and ERA), in the context of developing responses to the principal study questions outlined in Step 2 and to meet the DQOs ensuring that a representation of the current site condition can be achieved. The OMP scope for the 24 months of monitoring is outlined in Section 6. Following initial implementation (and review following each monitoring event), the available data will be reviewed and evaluated to determine if the frequency of monitoring should increase or decrease to provide better understanding of PFAS concentration fluctuations and potential risks to receptors. As additional information is gathered during the course of this investigation/monitoring, it may be beneficial for the proposed scope of works to be altered from the initial design. Changes to the proposed monitoring, if considered necessary, will be made based on risk profile reviews and updated CSM and in consultation with the Client Other factors that will optimise the design for obtaining data will include the use of laboratories that are NATA accredited for PFAS analysis and ensure laboratory LORs are suitable to meet the relevant adopted assessment levels (where possible), experienced field scientist(s), robust field and laboratory quality assurance/quality control protocols are adopted and Field and analytical data are collected in accordance with the PFAS NEMP (HEPA 2020), ASC NEPM (NEPC 2013) and the assessment of contaminated sites (DWER 2021).

An assessment of the Data Quality Indicators (DQIs) relating to both field and laboratory procedures will be undertaken with appropriate documentation provided for each environmental element or media assessed. The DQIs adopted for the DSI are summarised in Table 5-2.

Table 5-2 Data Quality Indicators

Data Quality Indicator	Detail
QA Documentation	Provision of appropriate work plans, DQI and DQO defined for the site and all QA/QC aspects documented.
Bias	A measure of the potential distortion in an analysis which can result in errors in one direction (e.g. one laboratory consistently higher results or consistent poor spiked matrix recovery). Bias will be assessed with reference to the analysis of spiked matrix samples (NEPC 1999b).
Representativeness	A qualitative measure of the confidence that data is representative of each medium present on the site. Use of appropriate and documented sampling methods, sampling handling, preservation and transport and holding times.
Precision:	A quantitative measure of data variability or reproducibility, measured by the calculation of %RPD values for duplicate samples (i.e. measure of agreement). Precision in DQI is considered an important assessment in an environmental study (USEPA, 2002, Guidance on Environmental Data Verification and Data Validation). It can be measured as follows: ▪ Percentage of the mean of the measurement such as Relative Percent Difference (i.e. %RPD). The %RPD will be calculated for the field and secondary duplicate (i.e. inter and intra-laboratory analysis); and ▪ Use of similar analytical method and instrument (e.g. for inter-laboratory assessment). The %RPD will be considered as acceptable if the values are: **Magnitude of result** / **Acceptable RPD range** <10 x limited of reporting (LOR) / No limits 10 – 20 x LOR / 0% - 50% >20 x LOR / 0% - 20% ▪ Should there be a result that is greater than acceptable RPD range, then a “review should be conducted of the cause (e.g. instrument calibration, appropriateness of method used)” (NEPC, 2013). For the purpose of this OMP, field and secondary duplicates should be collected at a rate of 1 in 10 samples (HEPA 2020 and RPS, 2018c).
Accuracy	A quantitative measure of the closeness of data to a ‘true value’, measured by the analysis of spike, blank and laboratory control samples (LCS). The LCS consists of a standard reference material or a matrix of known concentration. For the purpose of assessing accuracy it is required that at least one LCS for each process batch be analysed (NEPC, 2013).
Comparability	A qualitative measure of the confidence that data may be considered to be equivalent for each sampling and analytical event. By use of standard procedures, comparable methods, qualified personnel, and review of sample integrity.
Completeness	A measure of the amount of usable data (expressed as a percentage - %) from a data collection activity, based on completeness of test program, overall QA/QC completeness and validity of data set.

6 Ongoing Monitoring Program

6.1 OMP SAQP History

The changes made to the OMP SAQP since the Rev1 are documented in Table 6-1.

Table 6-1 OMP SAQP History

SAQP Version	Date	Report Section	Changes	Justification
Rev 2	17/12/2019	-	Formatting and figures updates, minor changes.	Defence review
Rev 3	18/08/2020	7	Update of assessment criteria and reference to HEPA (2020).	New guideline (HEPA, 2020)
		6.3	Replacement of decommissioned groundwater bores MW247, MW250 and MW260 by newly installed MW516, MW517, MW518 (respectively). Replacement of destroyed bore MW262 by MW010.	Monitoring network updates.
Rev 4	10/03/2021	6.3	Table 6-4 ‘Wells construction details’ added.	Defence review
		6	Methodology tables updates	
Rev 5	23/08/2021	Tables 6-5, 6-8, 6-9 & 6-10	Laboratory Testing (removal of some non-PFAS analytes for groundwater, surface water, porewater and sediment testing)	Defence review
Rev 6	09/03/2022	6.3	Replacement bore MW500 added for MW117	Monitoring network updates
Rev 7	11/08/2022	6	Damaged/destroyed monitoring wells removed from OMP monitoring locations (MW137, MW272, MW264, MW248, MW517, MW518, MW010).	Unable to sample these locations.
Rev 8	05/12/2022	6	Formatting updates, typos correction. MW261 (lost) removed.	Defence review
Rev 9	28/02/2023	6, 7, 9	Minor methodology updates, figure updates. Reference to soil criteria for sediment removed.	SAQP update
Rev 10	30/05/2023	6	Defence review. MW496 added in replacement of MW248.	Defence review
Rev 11	21/08/2023		Defence review	Defence review

6.2 Management Area Description

HMAS Stirling Garden Island and the marine nearshore environment are referred to as the “Management Area” (RPS, 2018c). The Management Area boundaries are presented on Figure 2, Appendix A.

6.3 Groundwater Monitoring

6.3.1 Groundwater Monitoring Network

The groundwater monitoring network sampled as part of the previous investigations at the site is summarised in Table 6-2.

Table 6-2 HMAS Stirling Groundwater Monitoring Network

Location	Screened aquifer	Well ID	Average Screen Interval (mBGL)
Demolition Ground	Superficial	MW137, MW139, MW141, MW142, MW147, MW149, MW272	3-6
Fire Training Area	Superficial	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128.	3-6
WWTP	Superficial	MW158, MW161, MW166, MW171, MW172, MW173, MW193, MW195S, MW196, MW197, MW199, MW200, MW202, MW203	No Log Available
	Deep	MW195D	10 - 13
Helicopter Support Facility	Superficial	MW214, MW215, MW216S MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282	4 - 7
AVCAT Storage and Fuel Farm	Superficial	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW247, MW248, MW249, MW516	No Log Available
	Deep	MW274D, MW291D	No Log Available
Fire Station, Flammable/ Hazardous Goods and Waste Storage, Ship Sullage	Superficial	MW010, MW250, MW255, MW256, MW257, MW258, MW259, MW260, MW261, MW262, MW517, MW518	3 - 6
Dredged Sediments	Superficial	MW264, MW268, MW269	2.5 – 5.5
Accommodation Area	Superficial	MW288, MW289	2.7 – 6.7
Source: RPS DSI Table A (PRS, 2018b) and ESdat database			

The groundwater monitoring locations as part of the OMP monitoring are presented in Table 6-3, along with the rationale for the selection, and are shown on Figures 3A-E, Appendix A.

Table 6-3 OMP Groundwater Monitoring Locations

Area	Monitoring Well / Bore ID	Rationale
Fire Training Area (Figure 3C)	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128	Confirmation of overall PFAS impact identified in the DSI (GHD, 2018). Assessment of overall changes in PFAS concentration in the source areas to provide temporal data on depletion of the source zone. Confirm the level of risk identified in the ERA.
Demolition Ground (Figure 3B)	MW139, MW141, MW142, MW147, MW149	
WWTP (Figure 3D)	MW158, MW161, MW166, MW171, MW172, MW173, MW193, MW196, MW197, MW199, MW200, MW202, MW203, MW195D, MW195S	
Accommodation Area (Figure 3D)	MW288, MW289	
Helicopter Support Facility (Figure 3F)	MW214, MW215, MW216, MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282	
Dredged Sediments (Figure 3E)	MW268, MW269	
AVCAT Storage and Fuel Farm (Figure 3E)	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW249, MW496, MW516	

Area	Monitoring Well / Bore ID	Rationale
Fire Station, Flammable / Hazardous Goods and Waste Storage, Ship Sullage (Figure 3E)	MW255, MW256, MW257, MW258, MW259	

Construction details for the groundwater wells monitored as part of the OMP are provided in Table 6-4.

Table 6-4 OMP Groundwater Monitoring Wells Construction Details

Well ID	Date drilled	Easting[1]	Northing[1]	RL TOC (mAHD)	Depth (mbTOC)	Screen interval (mbTOC)
MW109	2017	375573.399	6436243.395	4.446	5.5	2.5 - 5.5
MW112	2008	375513.7	6436208.38	3.973	6.0	3.0 - 6.0
MW120	2017	375449.982	6436134.215	4.409	5.5	2.5 - 5.5
MW121	2008	375552.25	6436122.78	3.7	5.7	2.7 – 5.7
MW123	2017	375585.05	6436093.989	6.62	8.0	4.5 - 8.0
MW124	2017	375835.849	6436297.305	1.899	4.0	0.750 - 4.0
MW125	2017	375846.238	6436213.778	1.882	3.9	0.9 - 3.9
MW126	2017	375873.534	6436085.061	1.948	3.9	0.9 - 3.9
MW127	2017	375925.611	6435948.027	1.771	3.9	0.9 - 3.9
MW128	2017	375670.344	6436212.685	4.537	5.5	2.5 - 5.5
MW139	2009	374964.76	6440104.47	2.273	5.0	2.0 - 5.0
MW141	2009	375021.66	6440143.5	3.025	5.0	2.0 - 5.0
MW142	2017	375033.148	6440146.157	2.573	4.0	0.25 - 4.0
MW147	2009	375032.34	6440124.29	3.423	5.0	2.0 - 5.0
MW149	2017	375064.008	6440095.63	2.303	4.0	1.0 - 4.0
MW158*		375550.33	6435719.4	14.541	15.8	
MW161*		375133.59	6435570.74	17.225	18.13	
MW166*		375049.03	6435410.26	11.89	13.0	10.0 - 13.0
MW171	2008	375226.79	6435237.5	29.238	31.5	28.5 - 31.5
MW172*		375283.14	6435355.8	16.772	26	
MW173*		375430.81	6435284.52	10.08	11.11	
MW193	2009	375508.55	6435098.21	11.86	13.5	10.5 - 13.5
MW195S	2008	375735.25	6435293.18	4.571	6.5	3.5 - 6.5
MW195D	2008	375737.03	6435293.35	4.363	13.0	10.0 - 13.0
MW196*		375995.91	6435294.6	12.75	13.8	
MW197*		376173.35	6435289.71	2.28		
MW199*		376029.54	6435161.036	11.8		
MW200*		376257.05	6435163.648	2.07		
MW202*		376468.79	6434833.07	2.121		
MW203*		376155.58	6434834.12	10.855		
MW214	2017	375891.231	6432273.413	8.075	9.0	5.5 - 9.0
MW215	2017	375849.425	6431907.202	3.794	4.5	1.5 - 4.5
MW216	2017	376015.304	6432232.151	8.329	9.0	6.0 - 9.0

Well ID	Date drilled	Easting[1]	Northing[1]	RL TOC (mAHD)	Depth (mbTOC)	Screen interval (mbTOC)
MW217	2017	376182.988	6432372.132	8.847	9.5	6.5 - 9.5
MW220*		376260.7742	6432333.207			
MW224	2017	376270.928	6432090.977	13.372	14.25	11.25 - 14.52
MW225	2017	376605.45	6431932.234	4.066	5.0	2.0 - 5.0
MW226	2017	376798.645	6432087.539	1.749	3.8	0.75 - 3.8
MW227	2017	376522.067	6432424.034	2.961	4.2	1.25 - 4.2
MW228	2017	376443.972	6432563.872	2.23	3.75	0.75 - 3.75
MW233*		376680.16	6434320.8	3.705	4.968	
MW236*		376256.45	6434168.67	4.6442	5.66	
MW238*		376846.72	6434047.83	4.827		
MW239*		376897.75	6434047.61	4.03		
MW240*		376825.33	6433978.29	4.483	6.8	
MW242*		376976.09	6434000.26	3.539	4.76	
MW243*		376825.22	6433936.86	4.892	7.0	
MW245*		376918.69	6433941.94	4.551	5.65	
MW249	2017	377131.46	6433911.436	5.227	6.5	3.5 - 6.5
MW255	2017	376282.378	6433831.895	4.609	6.0	3.0 - 6.0
MW256	2017	376342.186	6433831.509	3.835	6.0	3.0 - 6.0
MW257		376331	6433783	3.806	5.7	2.7 - 5.7
MW258		376320	6433758	4.043	6.0	3.0 - 6.0
MW259		376344	6433757	3.8	5.5	2.5 - 5.5
MW261*		376708.09	6433728.72	3.858	6.0	3.0 - 6.0
MW264	2017	376489.703	6433743.883	4.806	6.0	3.0 - 6.0
MW268	2017	376478.133	6433571.27	4.056	5.5	2.5 - 5.5
MW269	2017	376550.817	6433619.688	4.153	5.5	2.5 - 5.5
MW282	2017	376070.828	6432003.232	5.78	7.5	4.5 - 7.5
MW288	2017	376735.953	6434566.951	4.003	5.25	2.25 - 5.25
MW289	2017	376599.58	6434490.565	4.495	6.25	3.25 - 6.25
MW496	2019	376915.81	6433795.17	5.092	8.0	3.5 – 8.0
MW500	2019	375548.49	6436184.17	3.692	6.5	2.0 – 6.5
MW516	2020	376896.36	6433825.69	6.37	7.5	4.5 - 7.5

Notes:
1. MGA94 zone 50
RL – Relative Level
TOC – Top of Casing
* No bore log available

6.3.2 Monitoring Frequency

All groundwater monitoring locations listed in Table 6-3 will be sampled quarterly. The sampling events will be undertaken in March, June. September and December to record the concentration and extent of PFAS and determine any seasonal fluctuations or trends.

6.3.3 Groundwater Sampling Methodology

Groundwater monitoring will be undertaken by no purge HydraSleeve® method as detailed in Table 6-5.

Table 6-5 Groundwater Monitoring Wells – Sampling Method

Activity	Details
Well Gauging	Standing Water Level (SWL) will be gauged in each well prior to sampling using an interface probe. All wells will be measured against a specified mark at the top of the well casing. Gauging time will be recorded on field records. Snap gauging will be undertaken in each areas presented on Figure 3A to take in consideration the tide influence when inferring the groundwater contours.
Groundwater Field Parameters	The field parameters will be recorded via a pre-calibrated water quality meter from HydraSleeves® or hand bailed water. The following field parameters will be recorded: ▪ pH. ▪ electrical conductivity (EC). ▪ oxidation reduction potential (ORP). ▪ Dissolved oxygen (DO). ▪ Temperature. Once field parameters have stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurement will be recorded on field data records. All field instruments (e.g. water quality meter) will be calibrated by the equipment supplier and daily readings of reference solutions (bump tests) completed to optimise the accuracy of the measurements taken.
Deployment and Retrieval of HydraSleeves®	HydraSleeves® will be deployed with top weight sample collection to begin at the lowest point. HydraSleeves® sampling devices will be left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. Samples will be collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples will be discharged immediately (minimise changes in chemistry) via discharge tube. Following sampling, HydraSleeves® will be deployed in preparation for the next OMP monitoring event using the same string for consistency (same depth of sampling i.e. within screen depth).
Alternative sampling methodology (hand bailing)	Disposable HDPE hand bailers, attached to a polypropylene string, will be used in the event that the water column isn't sufficient to fill the hydrasleeve. Purging of the well (i.e. removal of 3x well volumes) will be undertaken prior to sampling to ensure that a sample representative of the aquifer is taken. Field parameters will be regularly recorded during the bailer purge to confirm field parameter stability is achieved.
Field Records	Field records will include the following information: ▪ Sampling time and date. ▪ Weather conditions. ▪ Sample Collection method. ▪ Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised. ▪ Calibration and daily bump test records. All sample documentation including field notebooks, reporting records, COC and equipment calibration certificates and procedures will be retained within project files.
Decontamination procedure	Dedicated HydraSleeves® and single use nitrile gloves will be used at each groundwater bore thus removing the need for decontamination. All re-usable sampling equipment will be thoroughly washed using PFAS-free detergent then double rinsed with clean water before the sample collection.

Activity	Details
Sample identification, preservation transport and holding times	Each sample bottle will be pre-labelled by the laboratory with a unique barcode which will be scanned into a mobile application to generate the Chain of Custody (CoC). Samples will be collected directly in appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under CoC documentation. Sample containers, preservation procedures, sample storage requirements and holding times will be undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998).
Laboratory Testing	▪ Full PFAS analytical suite (see Appendix B). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity, and ionic balance)
Laboratory Testing – Quality Control	Groundwater QC samples will be collected at the following frequencies as detailed in the OMP (Defence, 2019): ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples should be sent to a secondary laboratory. ▪ Rinsate blank sample at 1 per day per field personnel [collected off re-used sampling equipment (e.g. interface probe)]. ▪ Field blank samples at 1 per day per eskie.
Laboratory Accreditation and Limits of Reporting	All groundwater analysis will be undertaken by laboratories accredited by the NATA. ▪ Primary analysis will be undertaken by ALS Global Laboratories (Perth) ▪ Secondary analysis will be undertaken by Eurofins ARL (Perth). Laboratory LORs will be suitable to meet the relevant adopted assessment levels (0.01 µg/L).

6.4 Porewater, Surface Water and Sediment Monitoring

6.4.1 Monitoring Locations

The surface water, porewater and sediment locations, sampled as part of the DSI (RPS, 2018b) are summarised in Table 6-6.

Table 6-6 Summary of Porewater Surface Water and Sediment Monitoring Locations (RPS, 2018b)

Location	Porewater Monitoring Location	Sediment Monitoring Location	Surface Water Monitoring locations
Fire Training Area	PW129, PW130, PW131, PW132, PW133, PW134, PW135, PW136	SD129, SD130, SD131, SD132, SD133, SD134, SD135, SD136	SW129, SW130, SW131, SW132, SW133, SW134, SW135, SW136
Demolition Ground	PW150, PW151, PW152, PW153, PW154, PW155, PW156, PW157	SD150, SD151, SD152, SD153, SD154, SD155, SD156, SD157	SW150, SW151, SW152, SW153, SW154, SW155, SW156, SW157
WWTP	PW204, PW205, PW206, PW207, PW208	SD159, SD162, SD165, SD168, SD187, SD189, SD190, SD192, SD204, SD205, SD206, SD207, SD208	SW160, SW167, SW175, SW178, SW181, SW188, SW191, SW204, SW205, SW206, SW207, SW208
Helicopter Support Facility	PW229, PW230, PW231, PW232	SD229, SD230, SD231, SD232	SW229, SW230, SW231, SW232
Dredged Sediments	PW270, PW271	SD270, SD271	SW270, SW271

The porewater and sediment co-located monitoring locations and surface water monitoring locations are presented in Table 6-7 along with the rationale for the selection, and are highlighted on Figures 3A-F, Appendix A.

Table 6-7 OMP Surface Water, Porewater and Sediment Monitoring Locations

Area	Surface water Sampling Location ID	Sediment Sampling Location ID	Porewater Sampling Location ID	Rationale
Fire Training Area (Figure 3C)	SW130, SW132, SW134	SD335, SD340, SD341, SD362, SD363, SD364	PW335, PW340, PW341, PW362, PW363, PW364	Monitoring of these locations will provide an indication of any change in the nature or magnitude of PFAS in surface water, porewater and sediments, and will help in determining changes attributable to seasonal fluctuations. Confirm the level of risk identified in the ERA.
Demolition Ground (Figure 3B)	SW150, SW152, SW154, SW156	SD329, SD330, SD331, SD356, SD357, SD358	PW329, PW330, PW331, PW356, PW357, PW358	
WWTP (Figure 3D)	SW305, SW370, SW371, SW372, SW373, SW353, SW382, SW383, SW384	SD304, SD345, SD367, SD368, SD369, SD350, SD351, SD352, SD380, SD381, SD401	PW304, PW345, PW367, PW368, PW369, PW350, PW351, PW352, PW380, PW381, PW401	
Accommodation Area (Figure 3D)		SD346	PW346	
Helicopter Support Facility (Figure 3F)	SW309, SW310, SW311, SW406, SW408, SW410, SW412, SW414, SW416	SD306, SD307, SD308, SD314, SD315, SD316, SD405, SD407, SD409, SD411, SD413, SD415	PW306, PW307, PW308, PW314, PW315, PW316, PW405, PW407, PW409, PW411, PW413, PW415	
Dredged Sediments	SW317, SW318, SW319	SD374, SD375, SD378	PW374, PW375, PW378	

6.4.2 Surface Water, Porewater and Sediment Monitoring Frequency

The surface water, porewater and sediment monitoring locations listed in Section 6.4.1 will be sampled four times per year, in March, June, September and December to record the concentration and extent of PFAS and determine any seasonal fluctuations or trends.

This sampling should be conducted in conjunction with the groundwater monitoring described in Section 6.3

6.4.3 Surface Water Sampling Methodology

The methodology for the surface water monitoring is detailed in Table 6-8.

Table 6-8 Surface Water Investigation Methodology

Item	Details
Field parameters	Surface water physiochemical parameters (i.e. pH, electrical conductivity (EC), oxidation reduction potential (ORP), dissolved oxygen (DO), and temperature) will be recorded at the time of sampling using a pre-calibrated water quality meter. Field observations such as odours or sheen presence must also be recorded on field sampling sheets.
Sampling Method	Surface water samples will be collected directly into sample containers using a 'Grab' (manual) sample method via a long-handled sampling device. The sample container will be positioned 10 cm below the surface water level and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films. Samples will be decanted into the laboratory supplied sample containers. Samples will be collected in accordance with Australian/New Zealand Standards (AS/NZS 5667.1:1998) '*Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples'*.
Sample Collection	Water samples will be placed directly into appropriately labelled, laboratory supplied sample bottles and packed in chilled containers for delivery to the laboratory under Chain of Custody documentation.
Decontamination	All re-usable sampling equipment will be thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	Each sample bottle will be pre-labelled by the laboratory with a unique barcode which will be scanned into a mobile application to generate the Chain of Custody (CoC). Samples will be contained in appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under CoC documentation. Sample containers, preservation procedures, sample storage requirements and holding times will be undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).
Field Records	Field records will include the following information: ▪ Sampling time and date. ▪ Weather conditions. ▪ Sample Collection method. ▪ Depth of water body and sample. ▪ Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised. ▪ Calibration records. All sample documentation including field notebooks, reporting records, COC and equipment calibration certificates and procedures will be retained within project files.
Laboratory Testing	Surface water samples will be analysed for the following: ▪ Full PFAS analytical suite (see Appendix B). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride sulfate, alkalinity and ionic balance)

Item	Details
Laboratory Testing – Quality Control	Surface water QC samples will be collected at the following frequencies as detailed in the OMP: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples should be sent to a secondary laboratory. ▪ Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)].
Laboratory Accreditation and Limits of Reporting	All surface water analysis will be undertaken by laboratories accredited by the NATA. ▪ Primary analysis will be undertaken by ALS Global Laboratories (Perth) ▪ Secondary analysis will be undertaken by Eurofins ARL (Perth). Laboratory LORs will be suitable to meet the relevant adopted assessment levels (0.01 µg/L).

6.4.4 Sediment and Porewater Sampling Methodologies

The methodologies for sediment and porewater sampling are detailed in Table 6-9 and Table 6-10 respectively.

Table 6-9 Sediment Investigation Methodology

Item	Details
Sediment Sample Collection	Sediment samples will be collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under Chain of Custody documentation. At each sampling location, the sediment sample will be visually assessed and observations (including physical description) recorded on field data sheets.
Field Records	Field records will include the following information: ▪ Sampling time and date. ▪ Sample description and location characteristics. ▪ Weather conditions. ▪ Sample Collection method. ▪ Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised. All sample documentation including field notebooks, reporting records, COC and equipment calibration certificates and procedures will be retained within project files.
Decontamination	All re-usable sampling equipment will be thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Laboratory Testing	Sediment samples will be analysed for the following: ▪ Full PFAS analytical suite (see Appendix B).
Laboratory Testing – Quality Control	Sediment QC samples will be collected at the following frequencies as detailed in the OMP: ▪ Field duplicate (intra-laboratory) samples greater than 1 per 20 sediment samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples greater than 1 per 20 sediment samples should be sent to a secondary laboratory.
Laboratory Accreditation	All sediment analysis will be undertaken by laboratories accredited by the NATA. ▪ Primary analysis will be undertaken by ALS Global Laboratories (Perth) ▪ Secondary analysis will be undertaken by Eurofins ARL (Perth).

Table 6-10 Porewater Investigation Methodology

Item	Details
Field parameters	The following field parameters will be recorded: ▪ pH. ▪ EC. ▪ ORP. ▪ DO. ▪ Temperature. Once field parameters have stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) stabilised parameters' measurement will be recorded on field data records.
Porewater Sample Collection	Porewater sampling will be undertaken in accordance with the USEPA guidance *Operating Procedure Pore Water Sampling*. Porewater will be purged at flow rate less than 1 L per minute using a peristaltic pump, connected to a stainless steel tube with a screened section at its base (Drive-Point Piezometer). The pore water sampler will be inserted to at least 1 m below the surficial marine sediments, to ensure collection of pore water rather than surface water. Field parameters will be regularly recorded during the purging to confirm field parameter stability is achieved.
Field Records	Field records will include the following information: ▪ Sampling time and date. ▪ Weather conditions. ▪ Sample Collection method. ▪ Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised. All sample documentation including field notebooks, reporting records, COC and equipment calibration certificates and procedures will be retained within project files.
Decontamination	All re-usable sampling equipment will be thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection. Tubing will be replaced at each sampling location.
Laboratory Testing	Porewater samples will be analysed for the following: ▪ Full PFAS analytical suite (see Appendix B). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride sulfate, alkalinity, and ionic balance)
Laboratory Testing – Quality Control	Porewater QC samples will be collected at the following frequencies as detailed in the OMP: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 porewater samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 porewater samples should be sent to a secondary laboratory.
Laboratory Accreditation and Limits of Reporting	All porewater analysis will be undertaken by laboratories accredited by the NATA. ▪ Primary analysis will be undertaken by ALS Global Laboratories (Perth) ▪ Secondary analysis will be undertaken by Eurofins ARL (Perth). Laboratory LORs will be suitable to meet the relevant adopted assessment levels (0.01 µg/L).

7 Assessment Criteria

7.1 Groundwater, Porewater and Surface Water

The assessment levels adopted for groundwater, porewater and surface water in this OMP are based upon the Heads of Environmental Protection Authorities Australia and New Zealand PFAS National Environmental Management Plan 2.0 (NEMP; HEPA 2020) and finding of previous site assessment i.e. Detailed Site Investigation (DSI) (RPS, 2018b). The adopted assessment criteria for groundwater, porewater and surface water are detailed in Table 7-1.

Table 7-1 Criteria for Groundwater, Porewater and Surface Water

Receptor	Adopted Assessment Criteria
Ecological	**99% species protection level for Fresh Water and interim Marine Water:** ▪ PFOS – 0.00023* µg/L ▪ PFOA – 19 µg/L
Human Health	**Recreational Water:** ▪ PFOS + PFHxS – 2.0 µg/L ▪ PFOA – 10 µg/L **Drinking Water:** ▪ PFOS + PFHxS – 0.07 µg/L ▪ PFOA – 0.56 µg/L

*The criterion of 0.00023 µg/L is lower than the laboratory level of reporting (LOR), however, the PFAS NEMP 2020 allows for the adoption of the laboratory LOR as a screening level rather than a quantified measurement. At a minimum, the LOR to be adopted is to be consistent with the LORs in the DSI (RPS, 2018b).

7.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment.

8 Reporting

8.1 Factual Reporting

A factual report should be produced at the completion of each monitoring event that summarises the data and findings of each monitoring event. Each factual report will present the findings and contain the following information in accordance with the *PFAS OMP Factual Report Guidance* (Defence, 2021):

> Introduction

> Scope of work completed.

> Description of sampling methodologies used.

> Field observations (e.g. condition of monitoring wells, description of purged water) and water quality parameter measurements.

> Summary of any changes to the monitoring network condition that may affect data integrity, or require rectification works, and recommendations for repair, replacement of decommissioning of a location

> Evaluation of the applicability of adopted assessment levels.

> Review of the suitability of the data for assessment purposes (QA/QC evaluation).

> Summary tables presenting gauged groundwater and surface water levels.

> Presentation of inferred groundwater contours and inferred groundwater flow direction in a figure.

> Summary tables of analytical results in comparison to adopted assessment levels.

> Laboratory reports, Chain of Custody (CoC) documentation, field sampling records, data validation and QA/QC details, equipment calibration certificates and other relevant documentation.

In the event that further investigation, management and/or remediation are required, recommendations will be presented in a separate 'technical memorandum'.

8.2 Interpretive Reporting

Upon completion of each year's monitoring period an interpretive report will be prepared in accordance with the *PFAS OMP Annual Interpretive Report Guidance* (Defence, 2022). As a minimum, each interpretative report should include the following:

> The factual information described in Section 8.1.

> Evidence of compliance with the requirements of the SAQP and meeting stated objectives of the OMP.

> Relevant figures depicting sampling locations and site-specific hydrogeological features.

> Laboratory results and analysis including comparison with relevant screening criteria as identified in each OMP.

> Graphs showing historical concentrations of PFOS, PFOA and PFOS plus PFHxS.

> Assessment and commentary on appropriate Quality Assurance/ Quality Control (QA/QC) procedures.

> A discussion of analytical results in relation to the following:

- Trends in PFAS concentrations, including an assessment of temporal changes and/or changes to the extent of PFAS impacts. Trends should be assessed using an appropriate statistical analysis approach (e.g. using Mann-Kendall or similar analysis), with a specified level of confidence based upon the number of monitoring rounds completed.
- Consideration, based on data trends, as to whether any of the existing remediation / management measures should be re-assessed, with a view to potential modification, supplementation or cessation.
- Assessment of whether changes to the CSM and/or risk assessment are required.
- Whether recalibration or changes to the groundwater model are required to provide a better understanding of the potential future extent of PFAS impact in groundwater.

- Based on the data obtained, an assessment of the OMP sampling requirements with a view to establishing whether:
  - The number of locations monitored could be reduced, such as where PFAS concentrations are stable and are considered to present a low risk to receptors.
  - Additional monitoring locations are required, including the installation of new monitoring wells or sampling of additional existing wells to provide better understanding of the nature, extent or magnitude of PFAS impacts in a particular portion of the Management Area.
  - The frequency of monitoring should increase or decrease to provide better understanding of PFAS concentration fluctuations and potential risks to receptors.
  - Monitoring of additional media should be included in the OMP.
- An overview of remedial works or construction and maintenance activities undertaken in the management area during the reporting period, which may impact the CSM
- A statement as to whether the risk profile has changed overall, or for any specific location at the Site, and a recommendation as to whether this should trigger an OMP and/or PMAP review, or other action.

9 References

General References

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4. *Contaminated Sites Act 2003*, Western Australia.
5. Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.
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7. Department of Defence, May 2021, *PFAS OMP Factual Report Guidance*, Version 0.2.
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9. Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*.
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Site Specific References

16. Department of Defence, January 2019, *HMAS Stirling Garden Island PFAS Management Area Plan*, Final.
17. RPS, October 2018, *HMAS Stirling - PFAS Ongoing Monitoring Plan, Ref. EEC16094.005 (RPS, 2018a)*.
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23. Cardno, 16 April 2020, *PFAS OMP 2019 Q4 Quarterly Monitoring Factual Report, HMAS Stirling.*
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27. Cardno, 4 May 2021, *PFAS OMP 2020 Q4 Quarterly Sampling Event Factual Report, HMAS Stirling*.
28. Cardno, 15 June 2021, *PFAS OMP 2021 Q1 Quarterly Sampling Event Factual Report, HMAS Stirling*.
29. Cardno, 16 September 2021, *PFAS OMP 2020 Annual Interpretive Report, HMAS Stirling*.
30. Cardno, 5 August 2021, *PFAS OMP 2021 Q2 Quarterly Sampling Event Factual Report, HMAS Stirling*.
31. Cardno, 12 April 2022, *PFAS OMP 2021 Q4 Quarterly Sampling Event Factual Report, HMAS Stirling*.
32. Cardno, 3 August 2022, *PFAS OMP 2022 Q1 Quarterly Sampling Event Factual Report, HMAS Stirling*.

33. Cardno, 13 October 2022, *PFAS OMP 2022 Q2 Quarterly Sampling Event Factual Report, HMAS Stirling.*
34. Cardno, 9 December 2022, *PFAS OMP – 2021 Annual Interpretive Report, HMAS Stirling*.
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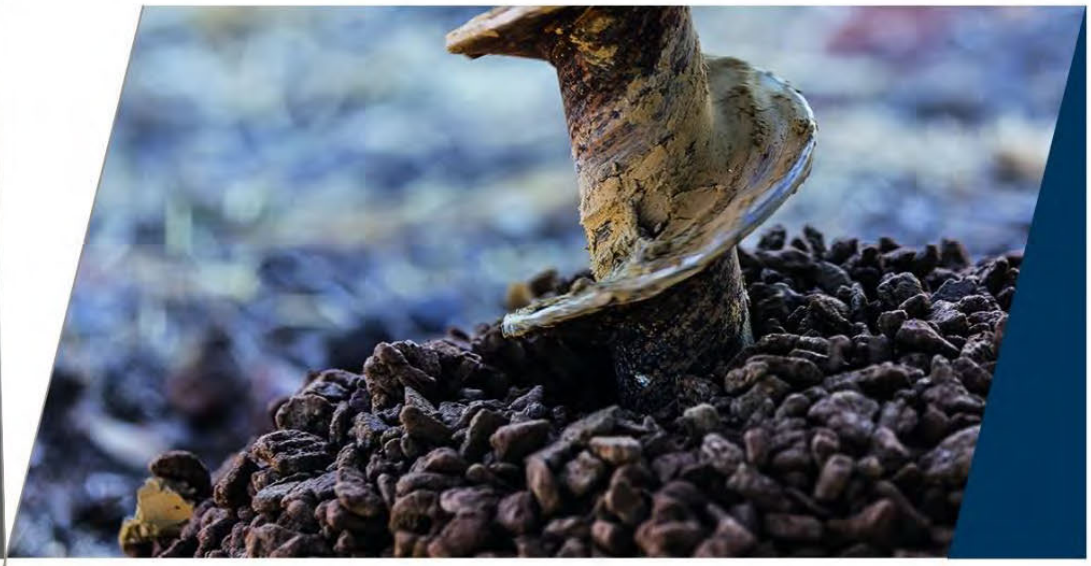


APPENDIX

A

Figures

FIGURE 1

1:32,000 Scale at A3

Metres

0 500 1,000

Site Location

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-02-27 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Earth

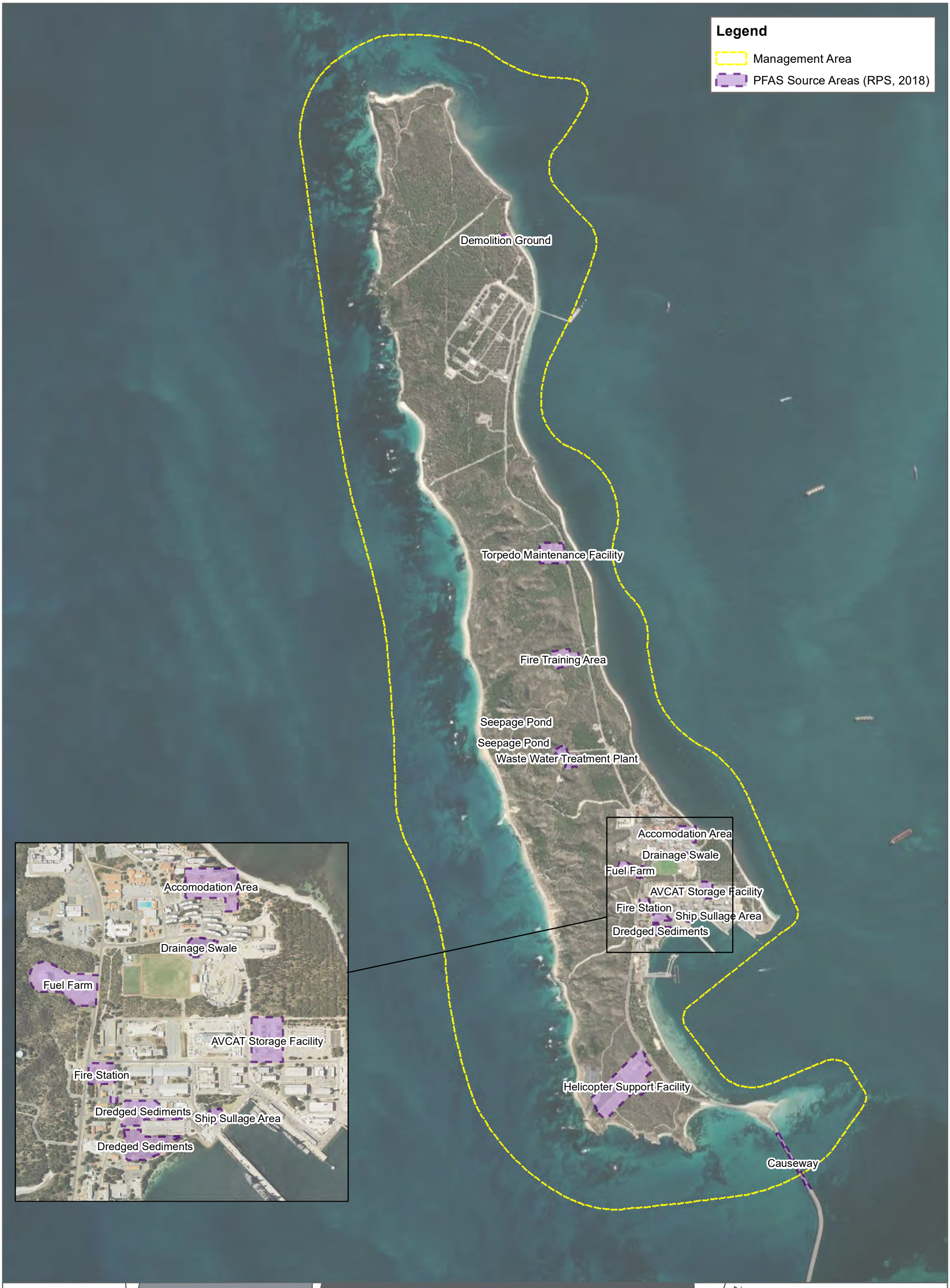


FIGURE 2

1:32,000 Scale at A3

Metres

0 500 1,000

Management Area

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-02-27 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002_ManagementArea 02.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

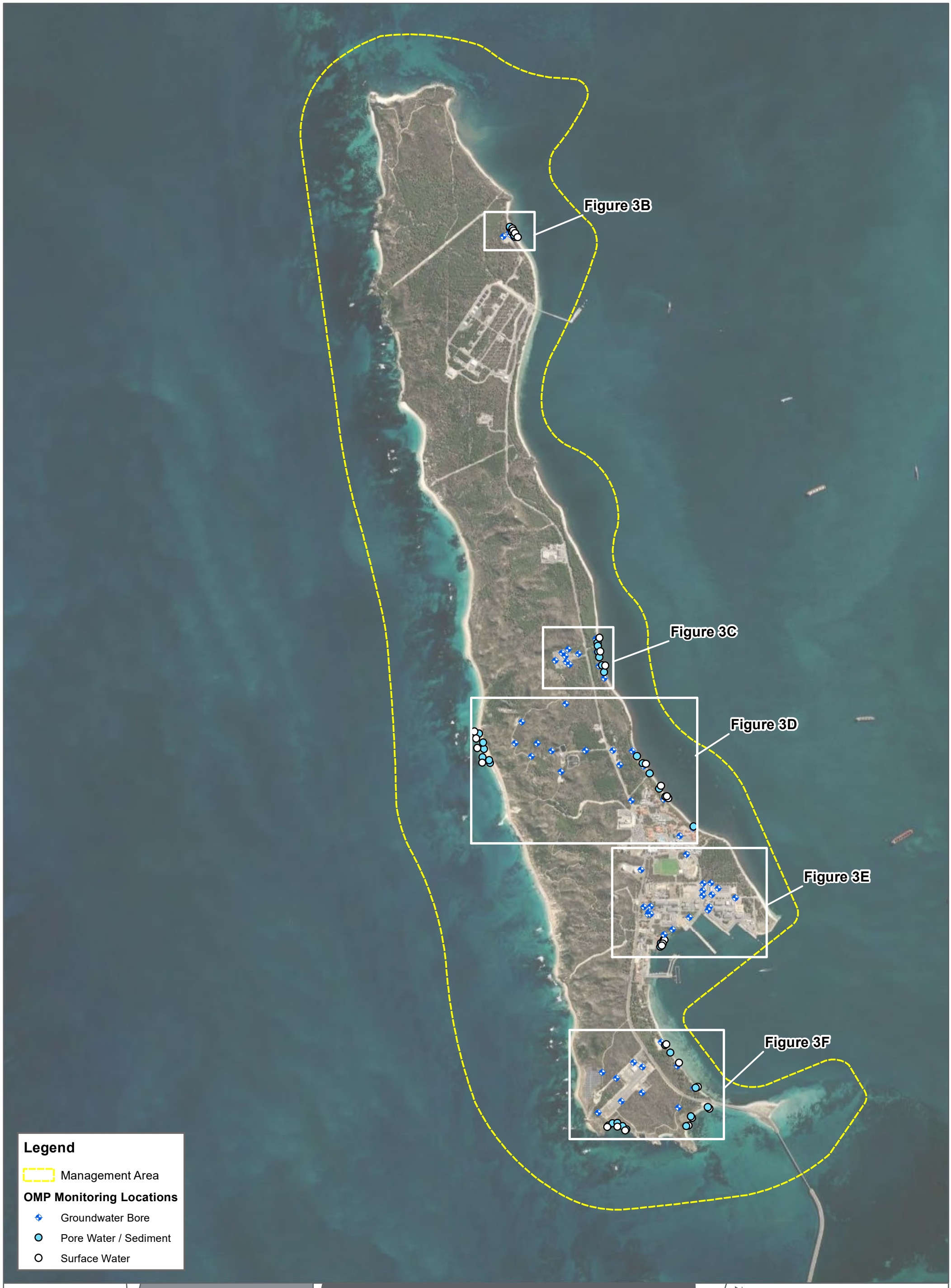


FIGURE 3A

1:32,000 Scale at A3

Metres

0 500 1,000

Monitoring Locations

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-02-27 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003A_MonitoringLocations 03.mxd
Aerial Imagery Supplied by Google Earth

FIGURE 3B

1:750 Scale at A3

Metres

0 25 50

Monitoring Locations

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-02-28 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003B_DemolitionGroundLocations 03.mxd
Aerial Imagery Supplied by Nearmap

FIGURE 3C

1:2,000 Scale at A3

Metres

0 50 100

Monitoring Locations

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-02-27 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003C_FireTrainingAreaLocations 03.mxd
Aerial Imagery Supplied by Aerometrex

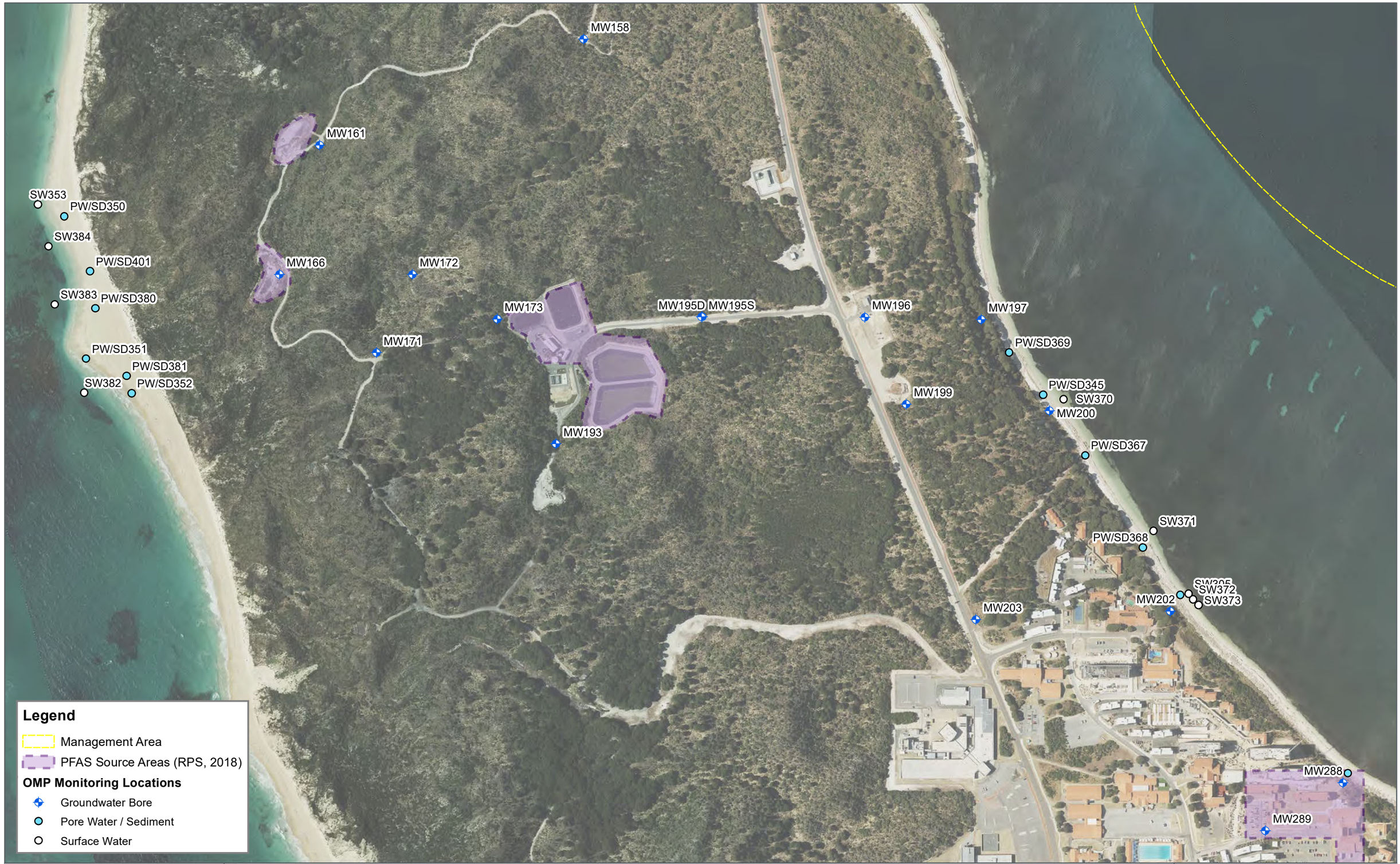


FIGURE 3D

1:5,500 Scale at A3

Metres

0 100 200

Monitoring Locations

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-02-27 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003D_WWTPLocations 03.mxd
Aerial Imagery Supplied by Nearmap

MW233
MW236
MW238
MW239
MW242
MW240
MW243
MW245
MW249
MW255
MW256
MW516
MW257
MW496
MW258
MW259
MW269
MW268
PW/SD378
SW317
PW/SD375
SW318
SW319
PW/SD374

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

OMP Monitoring Locations

- Groundwater
- Pore Water / Sediment
- Surface Water

FIGURE 3E

1:3,900 Scale at A3

Metres

0 100 200

Monitoring Locations

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-08-21 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003E_MainBaseLocations 03.mxd
Aerial Imagery Supplied by Nearmap

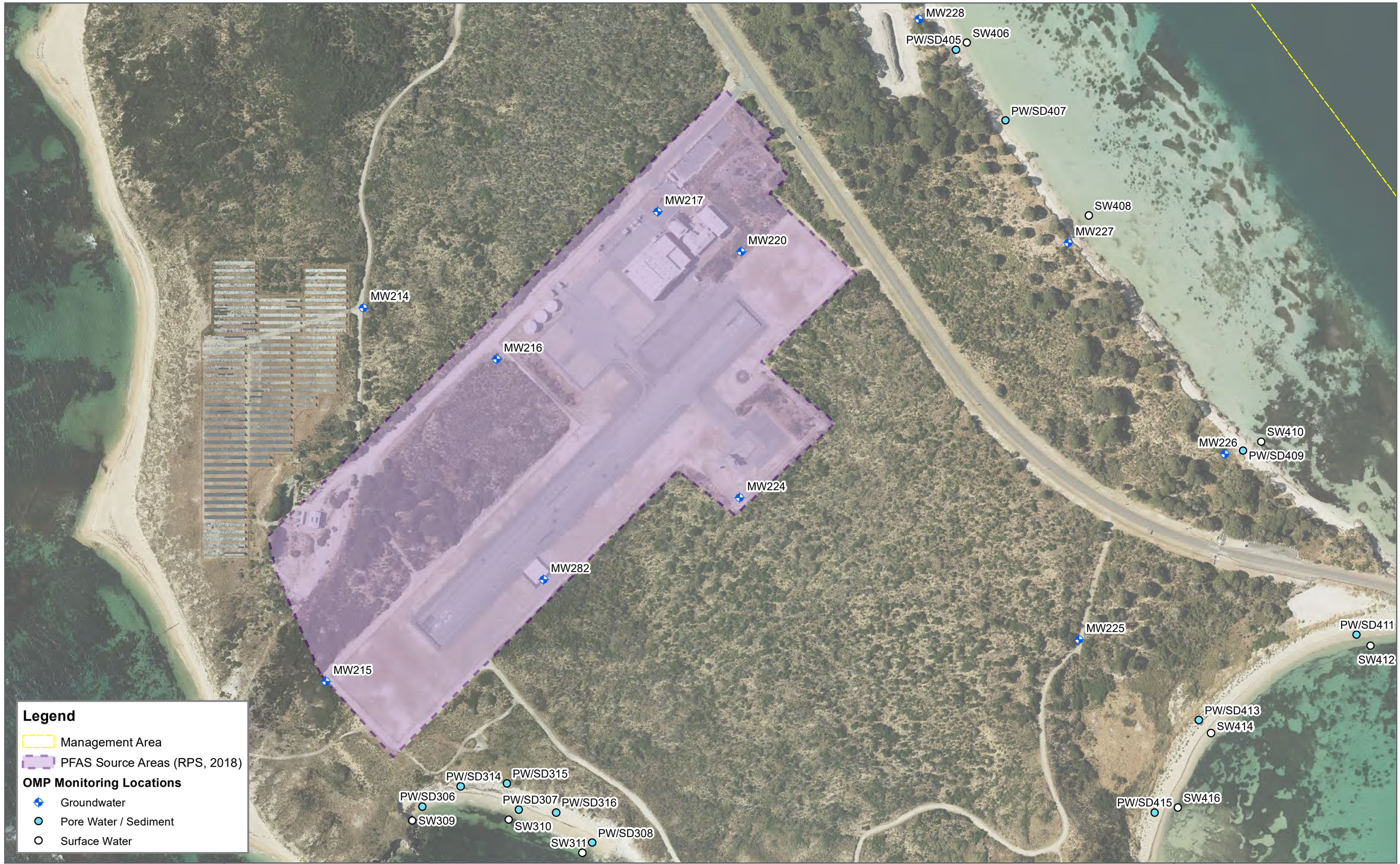


FIGURE 3F

1:3,500 Scale at A3

Metres

0 100 200

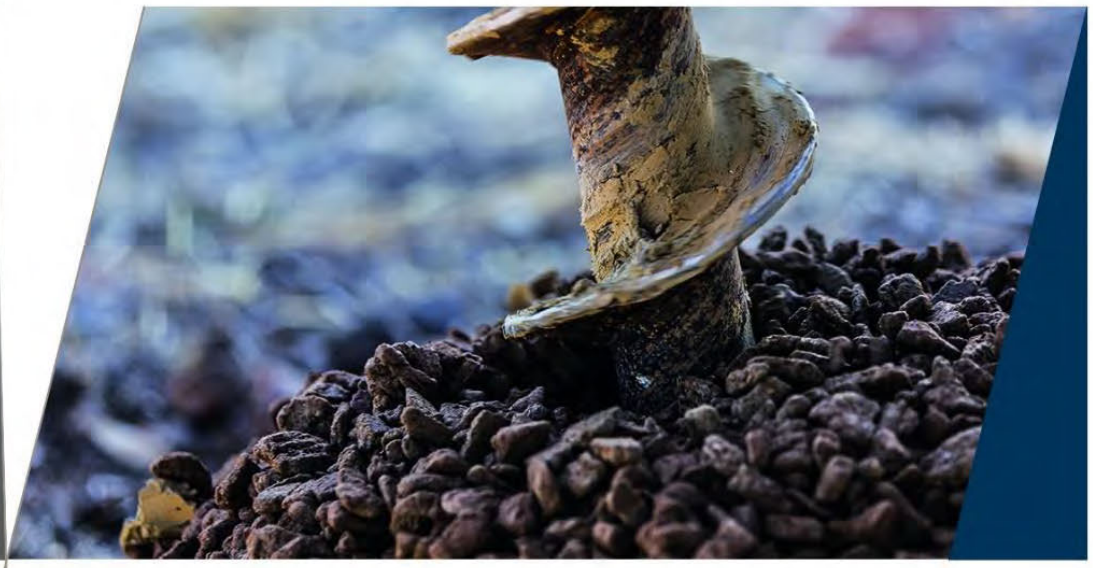
Monitoring Locations

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-02-27 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003F_HSFLocations 03.mxd
Aerial Imagery Supplied by Nearmap



APPENDIX

B

Full PFAS Analytical Suite

Full PFAS Analytical Suite

Group	Analyte	CAS No.
Perfluoroalkane Sulfonic Acids	Perfluorobutane sulfonic acid (PFBS)	375-73-5
	Perfluoropentane sulfonic acid (PFPeS)	2706-91-4
	Perfluorohexane sulfonic acid (PFHxS)	355-46-4
	Perfluoroheptane sulfonic acid (PFHpS)	375-92-8
	Perfluorooctane sulfonic acid (PFOS)	1763-23-1
	Perfluorodecane sulfonic acid (PFDS)	335-77-3
Perfluoroalkane Carboxylic Acids	Perfluorobutanoic acid (PFBA)	375-22-4
	Perfluoropentanoic acid (PFPeA)	2706-90-3
	Perfluorohexanoic acid (PFHxA)	307-24-4
	Perfluoroheptanoic acid (PFHpA)	375-85-9
	Perfluorooctanoic acid (PFOA)	335-67-1
	Perfluorononanoic acid (PFNA)	375-95-1
	Perfluorodecanoic acid (PFDA)	335-76-2
	Perfluoroundecanoic acid (PFUnDA)	2058-94-8
	Perfluorododecanoic acid (PFDoDA)	307-55-1
	Perfluorotridecanoic acid (PFTrDA)	72629-94-8
	Perfluorotetradecanoic acid (PFTeDA)	376-06-7
Perfluoroalkyl Sulfonamides	Perfluorooctane sulphonamide (FOSA)	754-91-6
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2
	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2
	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6
(n:2) Fluorotelomer Sulfonic Acids	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4
	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0

APPENDIX

C

FACTUAL REPORTS

Cardno

now

Stantec

PFAS OMP Quarterly Sampling Event Factual Report

December 2022

HMAS Stirling

304700525

Prepared for
Department of Defence

24 February 2023

Cardno

now

Stantec

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Document Information

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Job Reference	304700525
Date	24 February 2023
Version Number	Rev 1

Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
0.0	10/01/2023	Internal Draft	[redacted]	[redacted]
0	13/01/2023	External Draft (Client review)	[redacted]	[redacted]
1	24/02/2023	Revision 1	[redacted]	[redacted]

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Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

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Chemical Names

DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluoro-hexane Sulphonate
PFOA	Per-fluoro-octanoic Acid
PFOS	Per-fluoro-octane Sulfonate

Technical Terms

AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
AS	Australian Standard
BGL	Below Ground Level
CEC	Cation Exchange Capacity
COC	Chain of Custody
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
DWER	Department of Water and Environmental Regulation
EC	Electrical Conductivity
EPA	Environment Protection Authority
ERA	Ecological Risk Assessment
ESA	Environmental Site Assessment
HEPA	Heads of Environmental Protection Authority
LOR	Limit of Reporting
N/A	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEMP	National Environmental Management Plan
NEPM	National Environmental Protection Measure
ORP	Oxidation Reduction Potential
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
RWL	Reduced water levels
SAQP	Sampling and Analysis Quality Plan
SWL	Standing water level

Units

ha	Hectares
mAHD	Metres relative to the Australia Heigh Datum
mBGL	Metres Below Ground Level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
µg/L	Microgram per Litre
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity – Water)

Site Specific

OMP	Ongoing Monitoring Plan
FTG	Fire Training Ground
HSF	Helicopter Support Facility

1 Introduction

1.1 Background

Cardno was engaged by the Australian Department of Defence ("the Client") to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) at HMAS Stirling ("the site"). The site is located on Garden Island, Western Australia.

The OMP was carried out in accordance with the scope and limitations presented in Cardno's Sampling and Analysis Quality Plan (SAQP):

> Cardno, 5 December 2022, Reference: DEF19009, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling.* Rev 8.

The SAQP was reviewed prior to the Q4 2022 monitoring event, and one groundwater monitoring location (MW261) identified as lost during the Q3 2022 monitoring event was removed.

For the purposes of this report:

> The Management Area was defined as comprising of Garden Island and the marine nearshore environment (Figure 1A, Appendix A).

1.2 Purpose & Objectives

The objective of the OMP is to assess the changes in the nature and extent of PFAS within the environment, specifically where there is an identified potentially elevated risk to a receptor or a potential future risk to a receptor associated with Defence's historical use of legacy Aqueous Film Forming Foam (AFFF).

The purpose of this PFAS OMP factual report is to provide an up-to-date status of the condition of the site as it is currently understood in relation to the most recent sampling event.

The objectives of the report are:

> To provide a succinct summary of the Q4 2022 sampling event and provision of analytical results with supporting tables and figures.

> To provide confirmation of the current understanding of risk.

> To provide supporting data for the assessment of management actions, where relevant.

1.3 Relevant Guidelines

This assessment has been undertaken in general accordance with applicable industry standards for a site investigation for the purpose, objectives and scope identified in this report. These standards are set out in:

> National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended 2013) (ASC NEPM).

> Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, *PFAS National Environmental Management Plan (NEMP) 2.0*.

> Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds*.

> Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling*.

> Australian and New Zealand Guidelines, 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

> Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*[1].

[1] It is noted that the site is located on Commonwealth Land and is regulated under the Commonwealth environmental legislation, the State based DWER guidelines are relevant for the sampling of off-site properties and waterways.

> Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.

> U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*.

> USEPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8).*

> National Health and Medical Research Council (NHMRC), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

2 Scope of Work

Cardno carried out the tasks detailed in the following sections in order to satisfy the purpose and objectives of this assessment. The PFAS source areas are shown on Figure 1B, Appendix A.

2.1 Groundwater Monitoring

Sampling of selected groundwater monitoring wells was performed in general accordance with the SAQP (Cardno, 2022), applying methods set out in Section 3 of this report. The groundwater wells monitored as part of the OMP are presented in Table 2-1, and are shown on Figures 2A and 2B, Appendix A.

Table 2-1 Groundwater Monitoring Locations

Monitoring Area	Location ID	No.
Demolition Ground	MW139, MW141, MW142, MW147, MW149	5
Fire Training Area	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128	11
Waste water treatment plant	MW158, MW161, MW166, MW171, MW172, MW173, MW193, MW195D, MW195S, MW196, MW197, MW199, MW200, MW202, MW203	15
Accommodation Area	MW288, MW289	2
Dredged Sediments	MW268, MW269	2
AVCAT Storage and Fuel Farm	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW516, MW249	10
Fire Station, Flammable / Hazardous Goods and Waste Storage, Ship Sullage	MW255, MW256, MW257, MW258, MW259	5
Helicopter Support Facility	MW214, MW215, MW216, MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282	11

2.2 Porewater, Surface Water and Sediment Monitoring

Porewater, sediment and surface water sampling were performed in general accordance with the SAQP (Cardno, 2022), applying methods set out in Section 3 of this report. The porewater, surface water and sediment monitoring locations monitored as part of the OMP are presented in Table 2-2, and are shown on Figures 3A to 5B, Appendix A.

Table 2-2 Porewater, Surface Water and Sediment Monitoring Locations

Monitoring Area	Porewater Sampling Location ID	No.	Sediment Sampling Location ID	No.	Surface Water Sampling Location ID	No.
Demolition Ground	PW329, PW330, PW331, PW356, PW357, PW358	6	SD329, SD330, SD331, SD356, SD357, SD358	6	SW150, SW152, SW154, SW156	4
Fire Training Area	PW335, PW340, PW341, PW362, PW363, PW364	6	SD335, SD340, SD341, SD362, SD363, SD364	6	SW130, SW132, SW134	3
WWTP	PW304, PW345, PW367, PW368, PW369, PW350, PW351, PW352, PW380, PW381, PW401	11	SD304, SD345, SD367, SD368, SD369, SD350, SD351, SD352, SD380, SD381, SD401	11	SW305, SW370, SW371, SW372, SW373, SW353, SW382, SW383, SW384	9
Accommodation Area	PW346	1	SD346	1		
Dredged Sediments	PW374, PW375, PW378	3	SD374, SD375, SD378	3	SW317, SW318, SW319	3
Helicopter Support Facility	PW306, PW307, PW308, PW314, PW315, PW316, PW405, PW407, PW409, PW411, PW413, PW415	12	SD306, SD307, SD308, SD314, SD315, SD316, SD405, SD407, SD409, SD411, SD413, SD415	12	SW309, SW310, SW311, SW406, SW408, SW410, SW412, SW414, SW416	9

2.3 Data Management

All the data included in the report has been collected, uploaded, and reviewed according to the data management requirements of the *Defence Contamination Management Manual* (DCMM) Annex L (Defence, 2021), including:

- The sample naming convention detailed in the DCMM Annex L was used in the field;
- All field data collected was uploaded to the ESdat database;
- Laboratory data was uploaded and approved; and
- QA/QC data was reconciled.

2.4 Deviations from the OMP SAQP

Deviations from the SAQP for the Q4 2022 monitoring event are presented in Table 2-3 below.

Table 2-3 Deviations from OMP SAQP

Location	Deviation	Comments/Impact
MW147	Not sampled	Well blocked at 2.5mbgl. Medium impact, no data collected. It is also observed that this monitoring well is within dense overgrown bush and therefore access for repairs and ongoing sampling appear difficult. Replacement of the lost/compromised wells at the demolition ground is recommended.
MW496	Sampled	Sampled in replacement of nearby damaged well MW248 (removed from the SAQP). Replacement location deemed suitable as at proximity (<50m) to the damaged well, and similar screen depth (3.5 – 8.0 mBGL). Positive impact on the OMP – collection of additional PFAS data.

3 Methodology

3.1 Groundwater Sampling Methodology

Groundwater monitoring was generally undertaken by no purge HydraSleeve® method as detailed in Table 3-1.

Table 3-1 Groundwater Sampling Methodology

Activity	Details
Well Gauging	Standing Water Levels (SWL) were gauged using an interface probe. All wells were measured against a surveyed mark at the top of the well casing. Time of gauging was recorded on field records sheets.
Groundwater Field Parameters	Groundwater field parameters were recorded via a pre-calibrated water quality meter prior to deployment of HydraSleeves® or pre-sample collection. The following field parameters were recorded: ▪ pH ▪ electrical conductivity (EC) ▪ oxidation reduction potential (ORP) ▪ Dissolved oxygen (DO) ▪ Temperature Once field parameters were stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurement were recorded on field data records. All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and bump tested daily to optimise the accuracy of the measurements taken. Calibration certificates and bump test records are provided in Appendix D.
Deployment of HydraSleeve®	HydraSleeve® were deployed with top weight for sample collection to begin at the lowest point. Following Q4 2022 sampling, new HydraSleeve® were deployed in preparation for the next OMP monitoring event scheduled for Q1 2023, using the same string for consistency (same depth of sampling i.e. within screen depth).
Retrieval of HydraSleeve® (Sample Collection)	HydraSleeve® sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. HydraSleeve® used during Q4 2022 were the ones deployed following Q3 2022. Samples were collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples were discharged immediately (minimise changes in chemistry) via discharge tube.
Hand bailing (alternative sampling method)	Disposable HDPE hand bailers, attached to a polypropylene string, were used at wells where the water column wasn't sufficient to fill the HydraSleeve®. Purging of the well was undertaken prior to sampling to ensure that a sample representative of the aquifer is taken (i.e. removal of 3x well volume).
Decontamination procedure	Dedicated HydraSleeve® and HDPE hand bailers (single use and disposable) were used at each groundwater well thus removing the need for decontamination. All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample bottle was pre-labelled by the laboratory with a unique barcode. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). Where holding times did not comply, this is discussed in the data quality review in Appendix E.

Activity	Details
Quality Control	Groundwater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Groundwater samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance). The primary laboratory was ALS Global Laboratories (Perth), and the secondary laboratory (quality control) was Eurofins (Perth). Both laboratories are NATA-accredited for the parameters tested. Copies of the NATA stamped laboratory reports and CoC documentation are included in Appendix C.

3.2 Porewater and Sediment Sampling Methodology

The methodologies for sediment and porewater sampling are detailed in Table 3-2 and Table 3-3 respectively.

Table 3-2 Sediment Sampling Methodology

Item	Details
Sample Collection	Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.
Field Parameters	At each sampling location, the sediment sample was visually assessed, and observations (including physical description) were recorded on field data sheets.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Quality Control	Sediment QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples greater than 1 per 10 primary samples. ▪ Field triplicate (inter-laboratory) samples greater than 1 per 10 primary samples sent to a secondary laboratory.
Laboratory Testing	Sediment samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes).

Table 3-3 Porewater Sampling Methodology

Item	Detail
Porewater Sample Collection	Porewater sampling was undertaken in accordance with the USEPA guidance *Operating Procedure Pore Water Sampling*. Porewater was purged and sampled at less than 1 L per minute using a peristaltic pump, connected to a stainless steel tube with a screened section at its base (Drive-Point Piezometer). The porewater sampler was inserted to at least 1 m below the surficial marine sediments, to ensure collection of pore water rather than surface water. Tubing was replaced at each sampling location to prevent cross-contamination.
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.

Item	Detail
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Porewater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Porewater samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.3 Surface Water Sampling Methodology

The methodology for the surface water monitoring is detailed in Table 3-4.

Table 3-4 Surface water Sampling Methodology

Item	Details
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature Field observations such as odours or sheen presence were also recorded on field sampling sheets.
Sampling Method	Surface water samples were collected directly into sample containers using a 'Grab' (manual) sample method via a long-handled sampling device. The sample container was positioned 10 cm below the surface water level where possible and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films. Samples were collected in accordance with Australian/New Zealand Standards (AS/NZS 5667.1:1998) *Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Surface water QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Surface water samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.4 Quality Control / Quality Assurance

A critical aspect of site assessments is the demonstration of the quality of the data used as the basis for the assessment. This is achieved through a Data Validation process which includes a review of the following data quality indicators, as described in the SAQP:

> QA documentation.

> Bias.

> Data Representativeness.

- Data Precision & Accuracy.
- Laboratory Performance.
- Data Comparability.
- Data Set Completeness.

A detailed review of these aspects has been undertaken, the results of which are presented in Appendix E. The QA/QC review concluded that there are no significant systematic errors in the data collection process and therefore, the dataset used for the assessment is considered valid and complete.

3.5 Assessment Criteria

3.5.1 Groundwater, Porewater and Surface Water

The adopted assessment criteria for groundwater, porewater and surface water are detailed in Table 3-5.

Table 3-5 Criteria for Groundwater, Porewater and Surface Water

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	µg/L		
Human Health - Drinking Water Quality Guideline	0.07[1]	0.56	HEPA 2020
Human Health – Recreational Water	2[1]	10	HEPA 2020
Ecological – 99% species protection	0.00023[2]	19	HEPA 2020

Notes:

1. Sum of PFOS and PFHxS.
2. PFOS only. The criterion of 0.00023 µg/L is lower than the laboratory level of reporting (LOR), however, the PFAS NEMP 2020 allows for the adoption of the laboratory LOR as a screening level rather than a quantified measurement.

3.5.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. Sediment will be assessed against the NEMP (HEPA, 2020) soil criteria for consistency with the SAQP (Cardno, 2022), Detailed Site Investigation (DSI) (RPS, 2018b) and Ecological Risk Assessment (ERA) (RPS, 2018c). The adopted assessment criteria for sediments are detailed in Table 3-6.

Table 3-6 Criteria for Sediment

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	mg/kg		
Human Health - Commercial / industrial (on-base activities)	20[1]	50	HEPA 2020
Ecological - Direct exposure (interim guidelines)	1[2]	10	HEPA 2020
Ecological - Indirect exposure (interim guidelines) (on site)	0.01[2]	-	HEPA 2020

Notes:

1. Sum of PFOS and PFHxS.
2. PFOS only

4 Field Observations and Results

4.1 General Site Observations

No weather event that could have impacted the sampling or results obtained was observed. The maximum daily temperature during the monitoring event varied between 21.5 and 27.0ºC. Earthworks were still ongoing at the main Base area, however, didn't include dewatering or deep excavations works and therefore, are not considered to have affected the results obtained as part of the Q4 2022 monitoring event.

4.2 Groundwater

4.2.1 Summary of Field Observations

4.2.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the groundwater sampling event are presented in field sampling records, included in Appendix D. Field parameters were generally consistent with previous monitoring events. Groundwater pH ranged from 6.68 (MW124) to 8.14 (MW233) and was near neutral and water was observed clear to brown in colour. Groundwater temperature ranged from 15.7°C (MW233) to 23.6°C (MW500). DO readings ranged from 0.3 mg/L (MW124) to 7.37 mg/L (MW196) which mostly indicate aerobic groundwater condition. EC readings ranged from 414.9 µS/cm (MW233) to 43,543 µS/cm (MW125) and indicate fresh to highly saline groundwater conditions. There was a sulphur odour noted at several groundwater wells (MW124, MW126, MW127). Hydrocarbon odour was noted at MW245 within the fuel storage area which is consistent with previous event's field records.

4.2.1.2 Groundwater Elevation and Migration

Groundwater gauging data and reduced water levels (RWL) are provided within the field records in Appendix D. The groundwater elevations ranged between 0.16 mAHD (MW200) and 0.544 mAHD (MW171). It is expected that groundwater levels and flow direction for monitoring well relatively close to the shoreline are locally and temporally influenced by tidal pressures.

Gauging data was used to infer the groundwater migration contours. Groundwater flow was interpreted to be radial from the site and towards areas of depression following local topography (i.e. groundwater generally flows towards the nearest coastline), which is consistent with previous monitoring events. Groundwater inferred elevation contours and inferred flow direction for the Q4 2022 monitoring event are shown in Figure 6, Appendix A.

4.2.2 Groundwater Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-1. Laboratory results have also been compared to available historical data in order to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figures 2A and 2B in Appendix A presents the groundwater monitoring locations. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	MW112, MW120, MW141, MW172, MW236, MW282, MW500	0.56[2]	11.8 (MW282)	61	7

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
Sum of PFOS and PFHxS	MW109, MW112, MW120, MW121, MW125, MW128, MW141, MW142, MW161, MW166, MW171, MW172, MW173, MW193, MW203, MW215, MW216, MW217, MW220, MW228, MW233, MW236, MW239, MW240, MW243, MW249, MW255, MW256, MW257, MW258, MW259, MW268, MW269, MW282, MW288, MW289, MW496, MW500, MW516	0.07[2]	144.0 (MW141)	61	39
PFOS	MW109, MW112, MW120, MW121, MW123 MW128, MW139, MW141, MW142, MW161, MW166, MW171, MW172, MW173, MW193, MW202, MW216, MW217, MW220, MW233, MW236, MW239, MW242, MW243, MW245, MW249, MW255, MW256, MW257, MW258, MW259, MW269, MW282, MW288, MW289, MW496, MW500, MW516	0.01[3]	129.0 (MW141)	61	38

Notes:

1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> MW239, located at the AVCAT storage and fuel farm, reported a new exceedance of the drinking water guideline (0.07 µg/L, 0.33 µg/L detected) for the Sum of PFOS and PFHxS.

4.3 Surface Water

4.3.1 Summary of Field Observations

4.3.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the surface water sampling program are presented in field sampling record sheets, included in Appendix D. Parameters were generally consistent with the previous monitoring events. Surface water pH ranged from 7.8 (SW305) to 8.26 (SW406) and was near neutral, temperature was 23°C on average, water was generally clear and EC readings ranging 50,051 (SW410)) to 67,905 µS/cm (SW370) indicate highly saline conditions. DO readings ranging 3.07 (SW305) to 6.8 mg/L (SW373) indicate aerobic surface water conditions. No visual or olfactory evidence of contamination were recorded.

4.3.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-2. Laboratory results have also been compared to available historical data. Figures 3A and 3B in Appendix A presents the surface water monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-2 Summary of Surface water Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	28	0
Sum of PFOS and PFHxS	SW372, SW373	0.07[2]	0.68 (SW372)	28	2

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOS	SW130, SW132, SW134, SW305, SW370, SW371, SW372, SW373	0.01[3]	0.60 (SW372)	28	8

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the surface water monitoring locations in Q4 2022.

4.4 Porewater

4.4.1 Summary of Field Observations

4.4.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the porewater sampling program are presented in field sampling record sheets, included in Appendix D. Parameters were generally consistent with the previous monitoring events. Porewater pH ranging 7.35 (PW367) to 8.15 (PW381) was near neutral, with an average temperature of 21.9°C. Water was generally clear and EC readings ranging 16,802 (PW304) to 67,797 µS/cm (PW405) indicate saline to highly saline porewater conditions. DO readings ranging 0.29 (PW341) to 8.82 mg/L (PW380) mostly indicate aerobic porewater condition. No visual or olfactory evidence of contamination were observed.

4.4.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-3. Laboratory results have also been compared to available historical data. Figures 4A and 4B in Appendix A presents the porewater monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-3 Summary of Porewater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	0.03 (PW346)	39	0
Sum of PFOS and PFHxS	PW340, PW346, PW368, PW380	0.07[2]	5.87 (PW346)	39	4
PFOS	PW304, PW335, PW340, PW341, PW345, PW346, PW356, PW364, PW367, PW368, PW369, PW380, PW381, PW401	0.01[3]	5.54 (PW346)	39	14

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations in Q4 2022.

4.5 Sediment

4.5.1 Summary of Field Observations

Observations recorded during the sediment sampling program are provided in the field sampling records within Appendix D. Sediment samples were generally described as grey wet sand.

4.5.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. Soil criteria are adopted in the absence of criteria for sediment for consistency with the SAQP (Cardno, 2022), DSI (RPS, 2018b) and ERA (RPS, 2018c). A summary of results is presented in Table 4-4. Laboratory results have also been compared to available historical data. Figures 5A and 5B in Appendix A presents the sediment monitoring locations. Tabulated results are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-4 Summary of Sediment Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (mg/kg)	Max Conc. (mg/kg)	No. Analytical Results[4]	No. Results Above Criteria
PFOA	-	10[1]	<0.0002	39	0
Sum of PFOS and PFHxS	-	20[3]	0.0099 (SD346)	39	0
PFOS	-	0.01[2]	0.0097 (SD346)	39	0

Notes:

1. Ecosystems – direct exposure
2. Ecological - indirect exposure
3. Human health – comm/industrial
4. Non-inclusive of quality control samples

Findings are summarised as follows:

- No first-time detection or new exceedance of guideline values were reported for the sediment monitoring locations in Q4 2022.
- All sediment samples reported PFAS concentrations either below the LOR or at detectable values below the adopted assessment criteria.

4.6 Changes to the Monitoring Network Condition

No changes to the monitoring network condition were noted since the Q3 2022 monitoring event.

5 Summary and Conclusions

Cardno undertook the Q4 2022 groundwater, porewater, surface water and sediment monitoring event at HMAS Stirling as part of the PFAS OMP. Sampling and testing was undertaken at 61 monitoring wells, 28 surface water locations and 39 sediment and porewater co-located sampling locations.

Groundwater levels were gauged in all wells before sampling. Groundwater flow was interpreted to be radial from the site where mounding of groundwater is occurring (i.e. groundwater follows the site's topography and flows towards the ocean), consistent with the previous monitoring events.

The groundwater laboratory results reported the following:

- Of the 61 samples that were tested, PFOA (7 samples), PFOS (38 samples) and Sum of PFHxS and PFOS (39 samples) reported concentrations that exceeded adopted assessment criteria.
- MW239, located at the AVCAT storage and fuel farm, reported a new exceedance of the drinking water guideline (0.07 µg/L, 0.33 µg/L detected) for the Sum of PFOS and PFHxS.

The surface water laboratory results reported the following:

- Of the 28 samples tested, PFOS (8 samples) and Sum of PFHxS and PFOS (2 samples) were reported above the adopted assessment criteria.
- No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the surface water monitoring locations in Q4 2022.

The porewater laboratory results reported the following:

- Of the 39 samples that were tested, PFOS (14 samples) and Sum of PFOS and PFHxS (4 samples) reported concentrations above adopted assessment criteria.
- No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations in Q4 2022.

The sediment laboratory results reported the following:

- No first-time detection or new exceedance of guideline values were reported for the sediment monitoring locations in Q4 2022.
- All sediment samples reported PFAS concentrations either below the LOR or at detectable values below the adopted assessment criteria.

The following actions should be undertaken prior to the next OMP sampling event:

- Replacement of the groundwater monitoring wells lost/damaged at the demolition ground (MW147, MW272) and main base area (MW517, MW264, MW518, MW010, MW261).
- Protection of monitoring well MW239 at the AVCAT storage area.
- MW496 should be added to the OMP SAQP in replacement of MW248.

The next OMP sampling event for HMAS Stirling will be the quarterly monitoring event (Q1 2023), scheduled for March 2023. An Annual Interpretive Report will be prepared for the October 2021 – September 2022 monitoring period.

6 References

General References

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7. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (https://maps.water.wa.gov.au/#/webmap/gwm).
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Site Specific References

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20. Cardno, 23 September 2020, *PFAS OMP 2020 Q2 Quarterly Sampling Event Factual Report*, HMAS Stirling.
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28. Cardno, now Stantec, October 2022, *draft PFAS OMP 2021 Annual Interpretive Report.*

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APPENDIX

A

FIGURES

Cardno

now

Stantec

FIGURE 1A

1:32,000 Scale at A3

Meters

0 500 1,000

Site Location

Q4 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-01-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001A_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Map

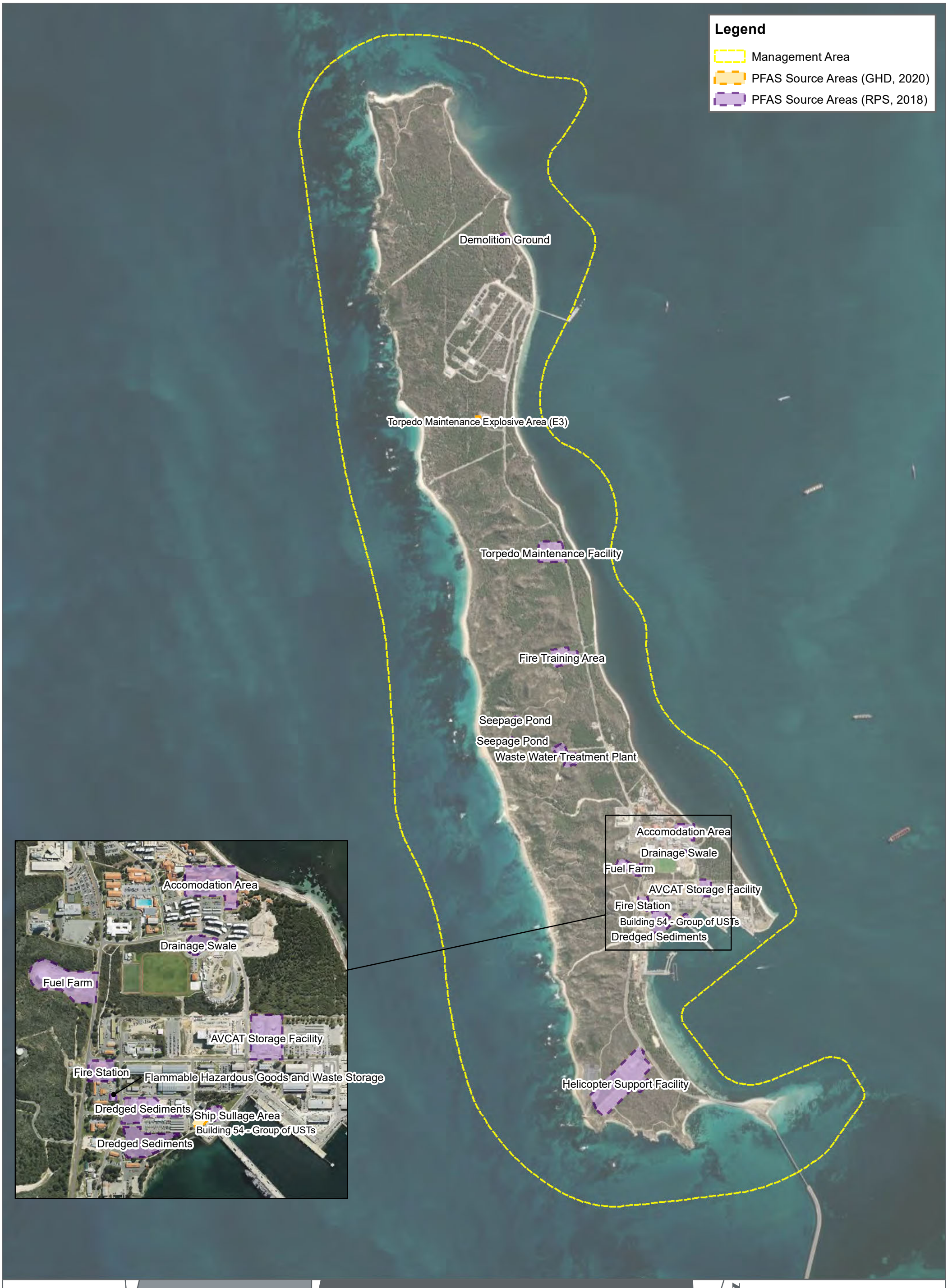


FIGURE 1B

1:32,000 Scale at A3

Meters

0 500 1,000

Management Area

Q4 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-01-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001B_ManagementArea 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap

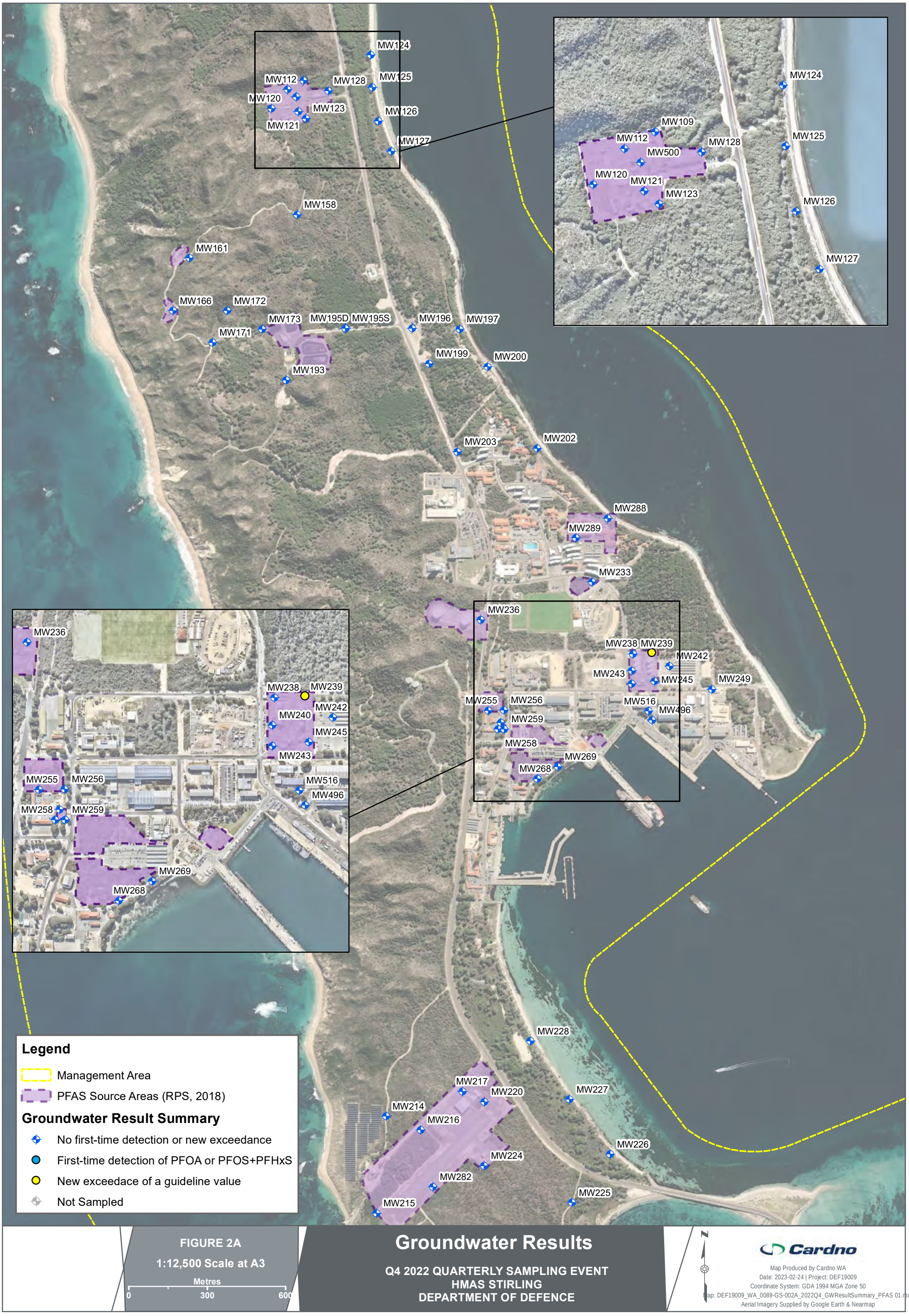


FIGURE 2A

1:12,500 Scale at A3

Metres

0 300 600

Groundwater Results

Q4 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-02-24 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002A_2022Q4_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

MW142
MW141
MW147
MW139
MW149
MW142
MW149
MW139
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Groundwater Result Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedace of a guideline value
Not Sampled
FIGURE 2B
1:15,000 Scale at A3
Meters
0
250
500
Groundwater Results
Q4 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-01-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002B_2022Q4_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

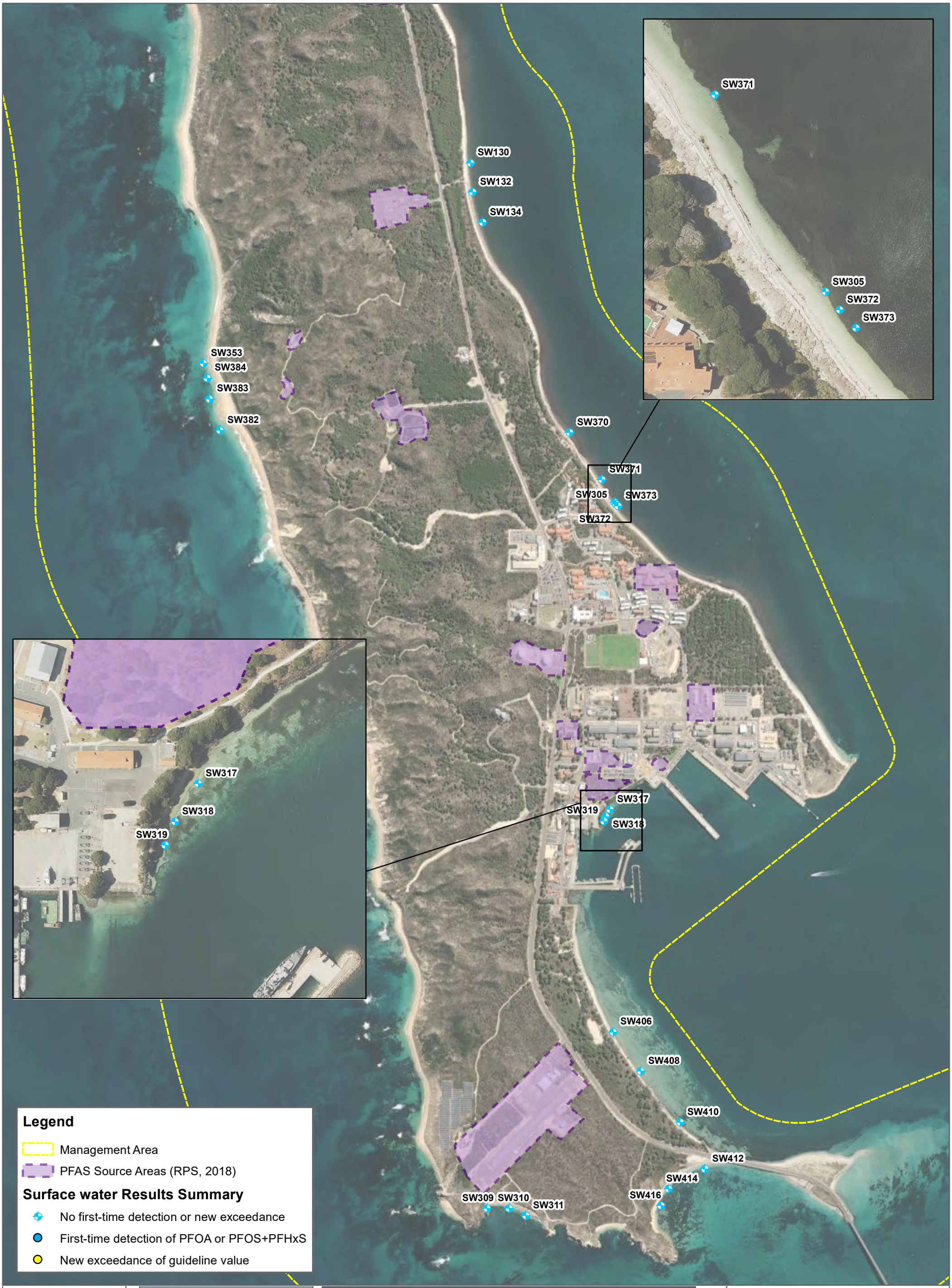


FIGURE 3A

1:15,000 Scale at A3

Metres

0 300 600

Surface water Results

Q4 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-02-24 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003A_2022Q4_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap

FIGURE 3B

1:15,000 Scale at A3

Metres

0 300 600

Surface water Results

Q4 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-02-24 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003B_2022Q4_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

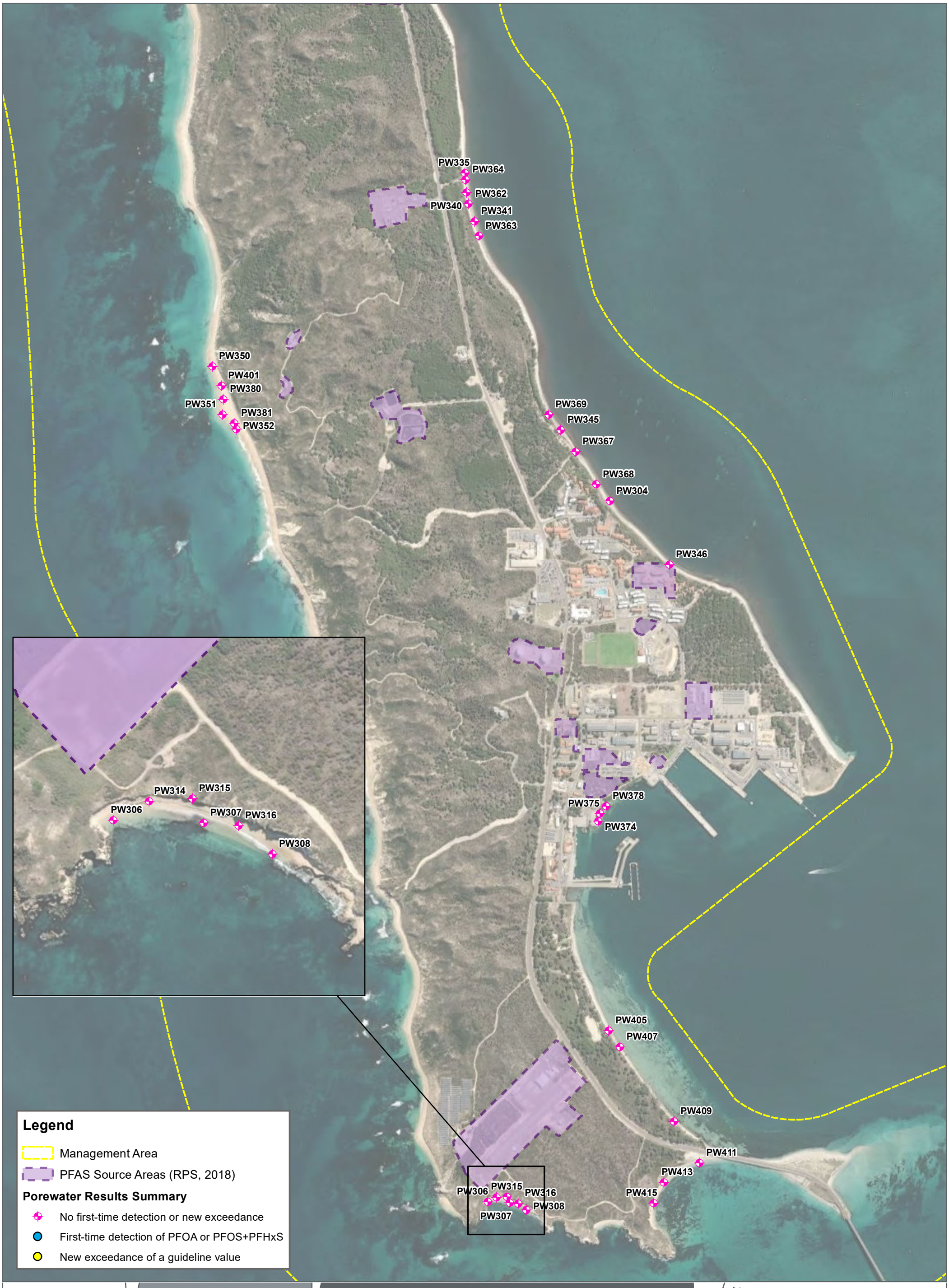

PW335
PW364
PW362
PW340
PW341
PW363
PW350
PW401
PW380
PW351
PW381
PW352
PW369
PW345
PW367
PW368
PW304
PW346
PW314
PW315
PW306
PW307
PW316
PW308
PW378
PW375
PW374
PW405
PW407
PW409
PW411
PW413
PW415
PW306
PW315
PW316
PW308
PW307
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Porewater Results Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
FIGURE 4A
1:15,000 Scale at A3
Metres
0
300
600
Porewater Results
Q4 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-02-24 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004A_2022Q4_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth

FIGURE 4B

1:15,000 Scale at A3

Metres

0 300 600

Porewater Results

Q4 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-02-24 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004B_2022Q4_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

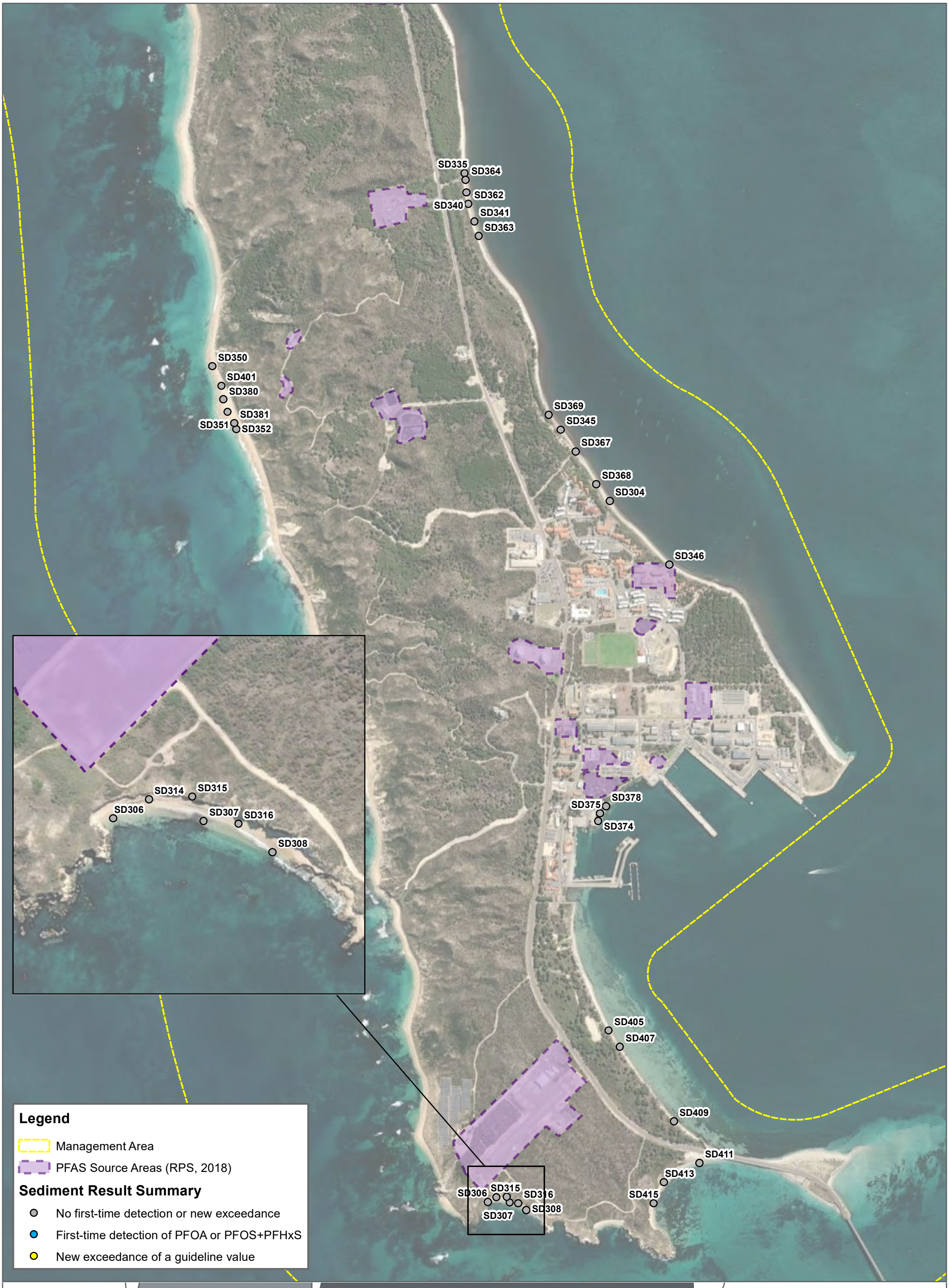

SD335
SD364
SD362
SD340
SD341
SD363
SD350
SD401
SD380
SD381
SD351
SD352
SD369
SD345
SD367
SD368
SD304
SD346
SD314
SD315
SD306
SD307
SD316
SD308
SD378
SD375
SD374
SD405
SD407
SD409
SD411
SD413
SD415
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sediment Result Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
FIGURE 5A
1:15,000 Scale at A3
Metres
0
300
600
Sediment Results
Q4 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-02-24 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005A_2022Q4_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth

FIGURE 5B

1:15,000 Scale at A3

Metres

0 300 600

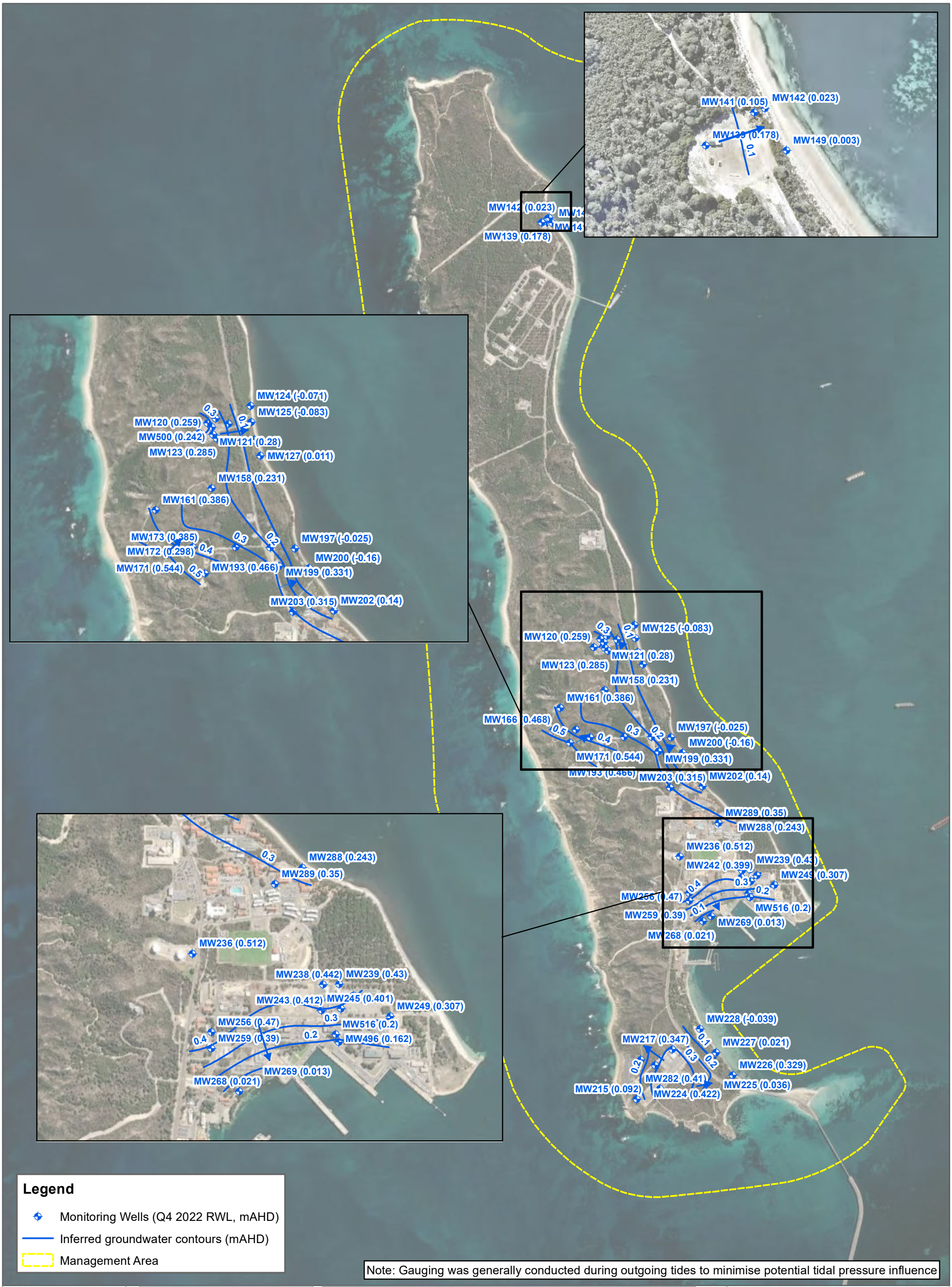
Sediment Results

Q4 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-02-24 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005B_2022Q4_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap


MW141 (0.105)
MW142 (0.023)
MW139 (0.178)
MW149 (0.003)
0.1
MW142 (0.023)
MW139 (0.178)
MW124 (-0.071)
MW125 (-0.083)
MW120 (0.259)
MW500 (0.242)
MW121 (0.28)
MW123 (0.285)
MW127 (0.011)
MW158 (0.231)
MW161 (0.386)
MW173 (0.385)
MW172 (0.298)
MW171 (0.544)
MW193 (0.466)
MW197 (-0.025)
MW200 (-0.16)
MW199 (0.331)
MW203 (0.315)
MW202 (0.14)
MW120 (0.259)
MW125 (-0.083)
MW121 (0.28)
MW123 (0.285)
MW158 (0.231)
MW161 (0.386)
MW166 (0.468)
MW197 (-0.025)
MW200 (-0.16)
MW171 (0.544)
MW199 (0.331)
MW193 (0.466)
MW203 (0.315)
MW202 (0.14)
MW289 (0.35)
MW288 (0.243)
MW236 (0.512)
MW242 (0.399)
MW256 (0.47)
MW516 (0.2)
MW259 (0.39)
MW269 (0.013)
MW268 (0.021)
MW288 (0.243)
MW289 (0.35)
MW236 (0.512)
MW238 (0.442)
MW239 (0.43)
MW243 (0.412)
MW245 (0.401)
MW249 (0.307)
MW256 (0.47)
MW516 (0.2)
MW259 (0.39)
MW496 (0.162)
MW269 (0.013)
MW268 (0.021)
MW228 (-0.039)
MW217 (0.347)
MW227 (0.021)
MW226 (0.329)
MW282 (0.41)
MW225 (0.036)
MW215 (0.092)
MW224 (0.422)
Legend
Monitoring Wells (Q4 2022 RWL, mAHD)
Inferred groundwater contours (mAHD)
Management Area
Note: Gauging was generally conducted during outgoing tides to minimise potential tidal pressure influence
FIGURE 6
1:32,000 Scale at A3
Meters
0
500
1,000
Inferred Groundwater Contours
Q4 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-01-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2022Q4_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

APPENDIX

B

DATA ASSESSMENT TABLES

Cardno

now

Stantec

					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids									
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water															*0.56*					
PFAS NEMP 2020 Interim Marine 99%									0.00023*						19					
PFAS NEMP 2020 Recreational Water															**10**					
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																
MW109	**12/12/2022**	**0089_MW109_221212**	**Normal**	**EP2216902**	0.08	0.13	0.62	<0.02	0.24	<0.02	<0.1	<0.02	0.07	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
MW112	**12/12/2022**	**0089_MW112_221212**	**Normal**	**EP2216902**	0.06	0.16	6.72	0.44	45.6	<0.02	0.1	0.24	0.84	0.22	*0.68*	0.03	<0.02	<0.02	<0.02	<0.02
MW120	**12/12/2022**	**0089_MW120_221212**	**Normal**	**EP2216902**	0.02	0.06	15.0	2.95	0.68	<0.02	<0.1	<0.02	0.12	<0.02	*1.60*	<0.02	<0.02	<0.02	<0.02	<0.02
MW121	**12/12/2022**	**0089_MW121_221212**	**Normal**	**EP2216902**	<0.02	<0.02	0.10	<0.02	0.06	<0.02	<0.1	0.02	0.04	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
MW123	**12/12/2022**	**0089_MW123_221212**	**Normal**	**EP2216902**	0.08	<0.02	0.06	<0.02	0.01	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW123	**12/12/2022**	**0089_QC114_221212**	**Field Duplicate**	**EP2216902**	0.09	<0.02	0.06	<0.02	0.01	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW123	**12/12/2022**	**0089_QC214_221212**	**Interlab Duplicate**	**950091**	0.08	<0.01	0.05	<0.01	0.01	<0.01	<0.05	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW124	**12/12/2022**	**0089_MW124_221212**	**Normal**	**EP2216878**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW125	**12/12/2022**	**0089_MW125_221212**	**Normal**	**EP2216878**	0.19	0.19	0.69	<0.02	<0.01	<0.02	<0.1	0.04	0.18	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW125	**12/12/2022**	**0089_QC103_221212**	**Field Duplicate**	**EP2216878**	0.19	0.21	0.74	<0.02	<0.01	<0.02	<0.1	0.04	0.15	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW125	**12/12/2022**	**0089_QC203_221212**	**Interlab Duplicate**	**950091**	0.15	0.15	0.61	<0.01	<0.01	<0.01	<0.05	0.03	0.21	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW126	**12/12/2022**	**0089_MW126_221212**	**Normal**	**EP2216878**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW127	**12/12/2022**	**0089_MW127_221212**	**Normal**	**EP2216878**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW127	**12/12/2022**	**0089_QC113_221212**	**Field Duplicate**	**EP2216878**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW127	**12/12/2022**	**0089_QC213_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW128	**12/12/2022**	**0089_MW128_221212**	**Normal**	**EP2216902**	0.05	0.04	0.33	0.09	6.43	<0.02	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
MW139	**12/12/2022**	**0089_MW139_221212**	**Normal**	**EP2216902**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW141	**12/12/2022**	**0089_MW141_221212**	**Normal**	**EP2216902**	0.33	0.94	15.0	1.42	129	<0.02	0.2	0.76	5.86	0.30	*0.99*	0.03	<0.02	<0.02	<0.02	<0.02
MW141	**12/12/2022**	**0089_QC101_221212**	**Field Duplicate**	**EP2216902**	0.38	1.05	17.5	1.54	140	<0.02	0.2	0.79	6.04	0.33	*1.07*	0.04	<0.02	<0.02	<0.02	<0.02
MW141	**12/12/2022**	**0089_QC201_221212**	**Interlab Duplicate**	**950091**	0.45	0.60	13	0.78	91	<0.01	0.22	0.58	6.4	0.31	*1.2*	0.04	<0.25	<0.01	<0.01	<0.01
MW142	**12/12/2022**	**0089_MW142_221212**	**Normal**	**EP2216902**	0.12	0.25	4.86	0.15	2.86	<0.02	<0.1	0.33	2.95	0.10	0.33	<0.02	<0.02	<0.02	<0.02	<0.02
MW149	**12/12/2022**	**0089_MW149_221212**	**Normal**	**EP2216902**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW158	**12/12/2022**	**0089_MW158_221212**	**Normal**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW161	**12/12/2022**	**0089_MW161_221212**	**Normal**	**EP2216876**	<0.02	<0.02	0.10	0.03	4.55	<0.02	<0.1	0.11	0.09	0.04	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
MW166	**12/12/2022**	**0089_MW166_221212**	**Normal**	**EP2216876**	0.06	0.07	1.16	0.18	7.80	<0.02	0.1	0.39	0.35	0.15	0.10	<0.02	<0.02	<0.02	<0.02	<0.02
MW171	**12/12/2022**	**0089_MW171_221212**	**Normal**	**EP2216876**	0.12	0.07	0.32	<0.02	0.02	<0.02	<0.1	0.09	0.20	0.05	0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW172	**12/12/2022**	**0089_MW172_221212**	**Normal**	**EP2216876**	1.67	1.56	12.7	2.27	17.9	<0.02	0.6	0.78	3.20	0.28	*0.75*	<0.02	<0.02	<0.02	<0.02	<0.02
MW173	**12/12/2022**	**0089_MW173_221212**	**Normal**	**EP2216876**	0.22	0.14	3.30	0.50	6.34	<0.02	<0.1	0.16	0.43	0.07	0.34	<0.02	<0.02	<0.02	<0.02	<0.02
MW193	**12/12/2022**	**0089_MW193_221212**	**Normal**	**EP2216876**	0.37	0.47	4.81	0.26	1.34	<0.02	<0.1	0.22	0.81	0.08	0.29	<0.02	<0.02	<0.02	<0.02	<0.02
MW195D	**12/12/2022**	**0089_MW195D_221212**	**Normal**	**EP2216876**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW195D	**12/12/2022**	**0089_QC111_221212**	**Field Duplicate**	**EP2216876**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW195D	**12/12/2022**	**0089_QC211_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW195S	**12/12/2022**	**0089_MW195S_221212**	**Normal**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW196	**13/12/2022**	**0089_MW196_221213**	**Normal**	**EP2216929**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW197	**12/12/2022**	**0089_MW197_221212**	**Normal**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW197	**12/12/2022**	**0089_QC115_221212**	**Field Duplicate**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW197	**12/12/2022**	**0089_QC215_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW199	**12/12/2022**	**0089_MW199_221212**	**Normal**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW199	**12/12/2022**	**0089_QC108_221212**	**Field Duplicate**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW199	**12/12/2022**	**0089_QC208_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW200	**12/12/2022**	**0089_MW200_221212**	**Normal**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW202	**12/12/2022**	**0089_MW202_221212**	**Normal**	**EP2216878**	<0.02	<0.02	0.03	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW203	**12/12/2022**	**0089_MW203_221212**	**Normal**	**EP2216878**	<0.02	<0.02	0.12	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW214	**13/12/2022**	**0089_MW214_221213**	**Normal**	**EP2216929**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW215	**13/12/2022**	**0089_MW215_221213**	**Normal**	**EP2216929**	<0.02	<0.02	0.24	<0.02	<0.01	<0.02	<0.1	0.04	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW216	**13/12/2022**	**0089_MW216_221213**	**Normal**	**EP2216929**	0.46	0.57	4.02	0.14	0.96	<0.02	8.3	27.3	15.0	0.51	0.32	<0.02	<0.02	<0.02	<0.02	<0.02
MW217	**13/12/2022**	**0089_MW217_221213**	**Normal**	**EP2216933**	<0.02	<0.02	0.03	<0.02	0.09	<0.02	0.5	1.86	1.63	0.50	0.24	<0.02	<0.02	<0.02	<0.02	<0.02
MW220	**13/12/2022**	**0089_MW220_221213**	**Normal**	**EP2216933**	0.14	0.08	1.22	0.21	22.4	<0.02	0.2	0.27	0.39	0.08	0.16	0.03	<0.02	<0.02	<0.02	<0.02
MW224	**13/12/2022**	**0089_MW224_221213**	**Normal**	**EP2216933**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW225	**13/12/2022**	**0089_MW225_221213**	**Normal**	**EP2216929**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW226	**13/12/2022**	**0089_MW226_221213**	**Normal**	**EP2216933**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW227	**13/12/2022**	**0089_MW227_221213**	**Normal**	**EP2216932**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW228	**13/12/2022**	**0089_MW228_221213**	**Normal**	**EP2216929**	0.17	0.10	0.23	<0.02	<0.01	<0.02	1.0	3.96	3.87	1.05	0.19	<0.02	<0.02	<0.02	<0.02	<0.02
MW233	**13/12/2022**	**0089_MW233_221213**	**Normal**	**EP2216932**	<0.02	<0.02	0.06	<0.02	0.17	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW236	**13/12/2022**	**0089_MW236_221213**	**Normal**	**EP2216932**	0.22	0.66	27.7	0.46	60.5	<0.02	<0.1	0.15	0.97	0.54	*1.46*	2.68	<0.02	<0.02	<0.02	<0.02

Table 1 - Water samples Analytical Results

					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids									
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water															*0.56*					
PFAS NEMP 2020 Interim Marine 99%									0.00023*						19					
PFAS NEMP 2020 Recreational Water															**10**					
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																
MW238	**13/12/2022**	**0089_MW238_221213**	**Normal**	**EP2216932**	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW239	**13/12/2022**	**0089_MW239_221213**	**Normal**	**EP2216932**	<0.02	<0.02	0.09	<0.02	0.24	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW240	**13/12/2022**	**0089_MW240_221213**	**Normal**	**EP2216932**	<0.02	<0.02	0.77	<0.02	<0.01	<0.02	<0.1	<0.02	0.07	0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02
MW242	**13/12/2022**	**0089_MW242_221213**	**Normal**	**EP2216932**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW243	**13/12/2022**	**0089_MW243_221213**	**Normal**	**EP2216932**	<0.02	<0.02	0.07	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW245	**13/12/2022**	**0089_MW245_221213**	**Normal**	**EP2216932**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW249	**13/12/2022**	**0089_MW249_221213**	**Normal**	**EP2216932**	<0.02	<0.02	0.22	<0.02	0.10	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW255	**13/12/2022**	**0089_MW255_221213**	**Normal**	**EP2216932**	0.23	0.43	10.6	<0.02	0.55	<0.02	<0.1	0.10	0.58	0.18	0.03	<0.02	<0.02	<0.02	<0.02	<0.02
MW256	**13/12/2022**	**0089_MW256_221213**	**Normal**	**EP2216932**	1.56	0.61	3.36	0.11	3.59	<0.02	0.6	0.97	1.86	0.14	0.18	<0.02	<0.02	<0.02	<0.02	<0.02
MW257	**13/12/2022**	**0089_MW257_221213**	**Normal**	**EP2216932**	<0.02	<0.02	0.35	<0.02	0.03	<0.02	<0.1	0.12	0.09	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW258	**13/12/2022**	**0089_MW258_221213**	**Normal**	**EP2216932**	2.72	1.85	6.38	0.29	5.16	<0.02	0.8	2.23	3.57	0.50	0.34	<0.02	<0.02	<0.02	<0.02	<0.02
MW259	**13/12/2022**	**0089_MW259_221213**	**Normal**	**EP2216932**	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.1	0.06	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW268	**13/12/2022**	**0089_MW268_221213**	**Normal**	**EP2216933**	0.05	0.05	0.34	<0.02	<0.01	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW269	**13/12/2022**	**0089_MW269_221213**	**Normal**	**EP2216933**	<0.02	<0.02	0.10	<0.02	0.19	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW282	**13/12/2022**	**0089_MW282_221213**	**Normal**	**EP2216933**	0.70	2.70	41.1	11.2	66.8	<0.02	0.3	0.56	3.55	1.06	***11.8***	0.04	<0.02	<0.02	<0.02	<0.02
MW288	**12/12/2022**	**0089_MW288_221212**	**Normal**	**EP2216878**	<0.02	<0.02	0.08	<0.02	1.80	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
MW289	**13/12/2022**	**0089_MW289_221213**	**Normal**	**EP2216932**	0.04	0.06	0.56	0.03	1.49	<0.02	<0.1	<0.02	0.04	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02
MW496	**13/12/2022**	**0089_MW496_221213**	**Normal**	**EP2216932**	0.06	0.07	1.08	0.14	8.00	<0.02	<0.1	<0.02	0.12	0.03	0.10	<0.02	<0.02	<0.02	<0.02	<0.02
MW500	**12/12/2022**	**0089_MW500_221212**	**Normal**	**EP2216902**	0.25	0.44	8.60	2.68	39.3	<0.02	0.1	0.21	1.09	0.21	*0.78*	<0.02	<0.02	<0.02	<0.02	<0.02
MW516	**13/12/2022**	**0089_MW516_221213**	**Normal**	**EP2216932**	0.08	0.03	0.39	0.03	1.62	<0.02	<0.1	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
PW304	**12/12/2022**	**0089_PW304_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW306	**13/12/2022**	**0089_PW306_221213**	**Normal**	**EP2217375**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW307	**13/12/2022**	**0089_PW307_221213**	**Normal**	**EP2217375**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW308	**13/12/2022**	**0089_PW308_221213**	**Normal**	**EP2217375**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW314	**13/12/2022**	**0089_PW314_221213**	**Normal**	**EP2217375**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW315	**13/12/2022**	**0089_PW315_221213**	**Normal**	**EP2217375**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW316	**13/12/2022**	**0089_PW316_221213**	**Normal**	**EP2217375**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW329	**12/12/2022**	**0089_PW329_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW330	**12/12/2022**	**0089_PW330_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW330	**12/12/2022**	**0089_QC105_221212**	**Field Duplicate**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW330	**12/12/2022**	**0089_QC205_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PW331	**12/12/2022**	**0089_PW331_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW335	**12/12/2022**	**0089_PW335_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW340	**12/12/2022**	**0089_PW340_221212**	**Normal**	**EP2216879**	<0.02	<0.02	0.06	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW341	**12/12/2022**	**0089_PW341_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW345	**13/12/2022**	**0089_PW345_221213**	**Normal**	**EP2216930**	<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW346	**12/12/2022**	**0089_PW346_221212**	**Normal**	**EP2216879**	0.04	0.04	0.33	0.05	5.54	<0.02	<0.1	0.03	0.07	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02
PW346	**12/12/2022**	**0089_QC118_221212**	**Field Duplicate**	**EP2216879**	0.06	0.05	0.44	0.07	6.88	<0.02	<0.1	0.05	0.10	0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
PW346	**12/12/2022**	**0089_QC218_221212**	**Interlab Duplicate**	**950091**	0.05	0.04	0.42	0.09	7.1	<0.01	<0.05	0.04	0.10	0.03	0.06	0.01	<0.01	<0.01	<0.01	<0.01
PW350	**12/12/2022**	**0089_PW350_221212**	**Normal**	**EP2216877**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW351	**12/12/2022**	**0089_PW351_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW352	**12/12/2022**	**0089_PW352_221212**	**Normal**	**EP2216877**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW356	**12/12/2022**	**0089_PW356_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW357	**12/12/2022**	**0089_PW357_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW358	**12/12/2022**	**0089_PW358_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW362	**12/12/2022**	**0089_PW362_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW362	**12/12/2022**	**0089_QC107_221212**	**Field Duplicate**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW362	**12/12/2022**	**0089_QC207_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PW363	**12/12/2022**	**0089_PW363_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW364	**12/12/2022**	**0089_PW364_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW367	**13/12/2022**	**0089_PW367_221213**	**Normal**	**EP2216930**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW368	**12/12/2022**	**0089_PW368_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.26	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW368	**12/12/2022**	**0089_QC116_221212**	**Field Duplicate**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.22	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW368	**12/12/2022**	**0089_QC216_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	0.01	<0.01	0.27	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PW369	**13/12/2022**	**0089_PW369_221213**	**Normal**	**EP2216930**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW374	**13/12/2022**	**0089_PW374_221213**	**Normal**	**EP2216934**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW375	**13/12/2022**	**0089_PW375_221213**	**Normal**	**EP2217375**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02

Table 1 - Water samples Analytical Results

					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids									
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water															*0.56*					
PFAS NEMP 2020 Interim Marine 99%									0.00023*						19					
PFAS NEMP 2020 Recreational Water															**10**					
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																
PW378	**13/12/2022**	**0089_PW378_221213**	**Normal**	**EP2216934**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW380	**12/12/2022**	**0089_PW380_221212**	**Normal**	**EP2216877**	<0.02	<0.02	0.03	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW381	**12/12/2022**	**0089_PW381_221212**	**Normal**	**EP2216877**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW401	**12/12/2022**	**0089_PW401_221212**	**Normal**	**EP2216877**	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW405	**13/12/2022**	**0089_PW405_221213**	**Normal**	**EP2216930**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW407	**13/12/2022**	**0089_PW407_221213**	**Normal**	**EP2216930**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW409	**13/12/2022**	**0089_PW409_221213**	**Normal**	**EP2216934**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW411	**14/12/2022**	**0089_PW411_221214**	**Normal**	**EP2216973**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW413	**14/12/2022**	**0089_PW413_221214**	**Normal**	**EP2216973**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
PW415	**14/12/2022**	**0089_PW415_221214**	**Normal**	**EP2216973**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW130	**12/12/2022**	**0089_SW130_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW132	**12/12/2022**	**0089_QC104_221212**	**Field Duplicate**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW132	**12/12/2022**	**0089_QC204_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW132	**12/12/2022**	**0089_SW132_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW134	**12/12/2022**	**0089_QC112_221212**	**Field Duplicate**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW134	**12/12/2022**	**0089_QC212_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW134	**12/12/2022**	**0089_SW134_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW150	**12/12/2022**	**0089_SW150_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW152	**12/12/2022**	**0089_SW152_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW154	**12/12/2022**	**0089_QC109_221212**	**Field Duplicate**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW154	**12/12/2022**	**0089_QC209_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW154	**12/12/2022**	**0089_SW154_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW156	**12/12/2022**	**0089_SW156_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW305	**12/12/2022**	**0089_SW305_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW309	**13/12/2022**	**0089_SW309_221213**	**Normal**	**EP2217375**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW310	**13/12/2022**	**0089_SW310_221213**	**Normal**	**EP2216930**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW311	**13/12/2022**	**0089_SW311_221213**	**Normal**	**EP2216930**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW317	**13/12/2022**	**0089_SW317_221213**	**Normal**	**EP2216934**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW318	**13/12/2022**	**0089_SW318_221213**	**Normal**	**EP2216934**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW319	**13/12/2022**	**0089_SW319_221213**	**Normal**	**EP2216934**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW353	**12/12/2022**	**0089_SW353_221212**	**Normal**	**EP2216877**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW370	**12/12/2022**	**0089_SW370_221212**	**Normal**	**EP2216877**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW371	**12/12/2022**	**0089_SW371_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW372	**12/12/2022**	**0089_SW372_221212**	**Normal**	**EP2216879**	<0.02	<0.02	0.08	<0.02	0.60	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW373	**12/12/2022**	**0089_SW373_221212**	**Normal**	**EP2216879**	<0.02	<0.02	0.04	<0.02	0.22	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW382	**12/12/2022**	**0089_SW382_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW383	**12/12/2022**	**0089_SW383_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW384	**12/12/2022**	**0089_SW384_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW406	**13/12/2022**	**0089_SW406_221213**	**Normal**	**EP2216969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW408	**13/12/2022**	**0089_SW408_221213**	**Normal**	**EP2216969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW410	**13/12/2022**	**0089_SW410_221213**	**Normal**	**EP2216934**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW412	**14/12/2022**	**0089_SW412_221214**	**Normal**	**EP2216973**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW414	**14/12/2022**	**0089_SW414_221214**	**Normal**	**EP2216973**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
SW416	**14/12/2022**	**0089_SW416_221214**	**Normal**	**EP2216973**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water

HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%

HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First-time detection of PFOA or PFHxS+PFOS

New exceedance of guideline value

					PFAS - (n:2) Fluorotelomer Sulfonic Acids					PFAS - Perfluoroalkyl Sulfonamides							PFAS			
					Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
LOR - Limit of Reporting					0.01	0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1
PFAS NEMP 2020 Drinking Water																	*0.07*			
PFAS NEMP 2020 Interim Marine 99%																				
PFAS NEMP 2020 Recreational Water																	**2**			
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																
MW109	**12/12/2022**	**0089_MW109_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.86*	1.03	1.16	10
MW112	**12/12/2022**	**0089_MW112_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.05	<0.05	<0.05	0.65	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***52.3***	54.5	55.7	6
MW120	**12/12/2022**	**0089_MW120_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***15.7***	17.4	20.4	10
MW121	**12/12/2022**	**0089_MW121_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.16*	0.24	0.24	11
MW123	**12/12/2022**	**0089_MW123_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.17	0.17	<1
MW123	**12/12/2022**	**0089_QC114_221212**	**Field Duplicate**	**EP2216902**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.18	0.18	
MW123	**12/12/2022**	**0089_QC214_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	0.16	0.18	
MW124	**12/12/2022**	**0089_MW124_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW125	**12/12/2022**	**0089_MW125_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.69*	1.10	1.29	<1
MW125	**12/12/2022**	**0089_QC103_221212**	**Field Duplicate**	**EP2216878**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.74*	1.12	1.33	<1
MW125	**12/12/2022**	**0089_QC203_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.61*	1.01	1.21	
MW126	**12/12/2022**	**0089_MW126_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW127	**12/12/2022**	**0089_MW127_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW127	**12/12/2022**	**0089_QC113_221212**	**Field Duplicate**	**EP2216878**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW127	**12/12/2022**	**0089_QC213_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	
MW128	**12/12/2022**	**0089_MW128_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.76***	6.86	6.99	<1
MW139	**12/12/2022**	**0089_MW139_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1
MW141	**12/12/2022**	**0089_MW141_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***144***	152	155	<1
MW141	**12/12/2022**	**0089_QC101_221212**	**Field Duplicate**	**EP2216902**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***158***	166	169	<1
MW141	**12/12/2022**	**0089_QC201_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***104***	113.16	114.8	
MW142	**12/12/2022**	**0089_MW142_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.72***	11.6	12.0	<1
MW149	**12/12/2022**	**0089_MW149_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW158	**12/12/2022**	**0089_MW158_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW161	**12/12/2022**	**0089_MW161_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.65***	4.91	4.94	<1
MW166	**12/12/2022**	**0089_MW166_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.96***	10.1	10.4	<1
MW171	**12/12/2022**	**0089_MW171_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.34*	0.81	0.88	<1
MW172	**12/12/2022**	**0089_MW172_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***30.6***	37.9	41.7	<1
MW173	**12/12/2022**	**0089_MW173_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.64***	10.9	11.5	<1
MW193	**12/12/2022**	**0089_MW193_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.15***	7.92	8.65	<1
MW195D	**12/12/2022**	**0089_MW195D_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1
MW195D	**12/12/2022**	**0089_QC111_221212**	**Field Duplicate**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1
MW195D	**12/12/2022**	**0089_QC211_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.01	<0.05	<0.1	
MW195S	**12/12/2022**	**0089_MW195S_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW196	**13/12/2022**	**0089_MW196_221213**	**Normal**	**EP2216929**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW197	**12/12/2022**	**0089_MW197_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW197	**12/12/2022**	**0089_QC115_221212**	**Field Duplicate**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW197	**12/12/2022**	**0089_QC215_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	
MW199	**12/12/2022**	**0089_MW199_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW199	**12/12/2022**	**0089_QC108_221212**	**Field Duplicate**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW199	**12/12/2022**	**0089_QC208_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	
MW200	**12/12/2022**	**0089_MW200_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW202	**12/12/2022**	**0089_MW202_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1
MW203	**12/12/2022**	**0089_MW203_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.12*	0.12	0.12	<1
MW214	**13/12/2022**	**0089_MW214_221213**	**Normal**	**EP2216929**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW215	**13/12/2022**	**0089_MW215_221213**	**Normal**	**EP2216929**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.24*	0.34	0.34	<1
MW216	**13/12/2022**	**0089_MW216_221213**	**Normal**	**EP2216929**	<0.05	<0.05	1.92	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.98***	58.8	59.5	<1
MW217	**13/12/2022**	**0089_MW217_221213**	**Normal**	**EP2216933**	<0.05	<0.05	10.2	0.30	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.12*	15.4	15.4	<1
MW220	**13/12/2022**	**0089_MW220_221213**	**Normal**	**EP2216933**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***23.6***	24.9	25.2	<1
MW224	**13/12/2022**	**0089_MW224_221213**	**Normal**	**EP2216933**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	4
MW225	**13/12/2022**	**0089_MW225_221213**	**Normal**	**EP2216929**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW226	**13/12/2022**	**0089_MW226_221213**	**Normal**	**EP2216933**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW227	**13/12/2022**	**0089_MW227_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
MW228	**13/12/2022**	**0089_MW228_221213**	**Normal**	**EP2216929**	<0.05	<0.05	0.66	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.23*	11.1	11.2	<1
MW233	**13/12/2022**	**0089_MW233_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.23*	0.23	0.23	<1
MW236	**13/12/2022**	**0089_MW236_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***88.2***	91.5	95.3	<1

Table 1 - Water samples Analytical Results

					PFAS - (n:2) Fluorotelomer Sulfonic Acids					PFAS - Perfluoroalkyl Sulfonamides							PFAS			
					Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
LOR - Limit of Reporting					0.01	0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1
PFAS NEMP 2020 Drinking Water																	*0.07*			
PFAS NEMP 2020 Interim Marine 99%																				
PFAS NEMP 2020 Recreational Water																	**2**			
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																
MW238	**13/12/2022**	**0089_MW238_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1
MW239	**13/12/2022**	**0089_MW239_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.33*	0.33	0.33	<1
MW240	**13/12/2022**	**0089_MW240_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.77*	0.92	0.92	<1
MW242	**13/12/2022**	**0089_MW242_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1
MW243	**13/12/2022**	**0089_MW243_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1
MW245	**13/12/2022**	**0089_MW245_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1
MW249	**13/12/2022**	**0089_MW249_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.32*	0.34	0.34	<1
MW255	**13/12/2022**	**0089_MW255_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***11.2***	12.3	12.7	<1
MW256	**13/12/2022**	**0089_MW256_221213**	**Normal**	**EP2216932**	<0.05	<0.05	0.12	<0.05	<0.05	0.04	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.95***	12.4	13.1	<1
MW257	**13/12/2022**	**0089_MW257_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.38*	0.60	0.60	4
MW258	**13/12/2022**	**0089_MW258_221213**	**Normal**	**EP2216932**	<0.05	<0.05	0.19	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***11.5***	21.9	24.0	<1
MW259	**13/12/2022**	**0089_MW259_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	0.20	0.20	<1
MW268	**13/12/2022**	**0089_MW268_221213**	**Normal**	**EP2216933**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.34*	0.41	0.46	<1
MW269	**13/12/2022**	**0089_MW269_221213**	**Normal**	**EP2216933**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.29*	0.31	0.31	<1
MW282	**13/12/2022**	**0089_MW282_221213**	**Normal**	**EP2216933**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***108***	126	140	<1
MW288	**12/12/2022**	**0089_MW288_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.88*	1.88	1.88	<1
MW289	**13/12/2022**	**0089_MW289_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.05***	2.16	2.25	4
MW496	**13/12/2022**	**0089_MW496_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.08***	9.39	9.60	4
MW500	**12/12/2022**	**0089_MW500_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***47.9***	50.5	53.7	<1
MW516	**13/12/2022**	**0089_MW516_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.01***	2.13	2.19	<1
PW304	**12/12/2022**	**0089_PW304_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1
PW306	**13/12/2022**	**0089_PW306_221213**	**Normal**	**EP2217375**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW307	**13/12/2022**	**0089_PW307_221213**	**Normal**	**EP2217375**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW308	**13/12/2022**	**0089_PW308_221213**	**Normal**	**EP2217375**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW314	**13/12/2022**	**0089_PW314_221213**	**Normal**	**EP2217375**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW315	**13/12/2022**	**0089_PW315_221213**	**Normal**	**EP2217375**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW316	**13/12/2022**	**0089_PW316_221213**	**Normal**	**EP2217375**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW329	**12/12/2022**	**0089_PW329_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW330	**12/12/2022**	**0089_PW330_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW330	**12/12/2022**	**0089_QC105_221212**	**Field Duplicate**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	
PW330	**12/12/2022**	**0089_QC205_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	
PW331	**12/12/2022**	**0089_PW331_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW335	**12/12/2022**	**0089_PW335_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1
PW340	**12/12/2022**	**0089_PW340_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09	<1
PW341	**12/12/2022**	**0089_PW341_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1
PW345	**13/12/2022**	**0089_PW345_221213**	**Normal**	**EP2216930**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1
PW346	**12/12/2022**	**0089_PW346_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.87***	6.04	6.13	4
PW346	**12/12/2022**	**0089_QC118_221212**	**Field Duplicate**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.32***	7.60	7.72	5
PW346	**12/12/2022**	**0089_QC218_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	0.02	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***7.52***	7.82	7.98	
PW350	**12/12/2022**	**0089_PW350_221212**	**Normal**	**EP2216877**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW351	**12/12/2022**	**0089_PW351_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW352	**12/12/2022**	**0089_PW352_221212**	**Normal**	**EP2216877**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW356	**12/12/2022**	**0089_PW356_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1
PW357	**12/12/2022**	**0089_PW357_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW358	**12/12/2022**	**0089_PW358_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW362	**12/12/2022**	**0089_PW362_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW362	**12/12/2022**	**0089_QC107_221212**	**Field Duplicate**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1
PW362	**12/12/2022**	**0089_QC207_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	
PW363	**12/12/2022**	**0089_PW363_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW364	**12/12/2022**	**0089_PW364_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1
PW367	**13/12/2022**	**0089_PW367_221213**	**Normal**	**EP2216930**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1
PW368	**12/12/2022**	**0089_PW368_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.26*	0.26	0.26	<1
PW368	**12/12/2022**	**0089_QC116_221212**	**Field Duplicate**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.22*	0.22	0.22	<1
PW368	**12/12/2022**	**0089_QC216_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.28*	0.28	0.28	
PW369	**13/12/2022**	**0089_PW369_221213**	**Normal**	**EP2216930**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1
PW374	**13/12/2022**	**0089_PW374_221213**	**Normal**	**EP2216934**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW375	**13/12/2022**	**0089_PW375_221213**	**Normal**	**EP2217375**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1

Table 1 - Water samples Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids					PFAS - Perfluoroalkyl Sulfonamides							PFAS			
					Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
LOR - Limit of Reporting					0.01	0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1
PFAS NEMP 2020 Drinking Water																	*0.07*			
PFAS NEMP 2020 Interim Marine 99%																				
PFAS NEMP 2020 Recreational Water																	**2**			
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																
PW378	**13/12/2022**	**0089_PW378_221213**	**Normal**	**EP2216934**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW380	**12/12/2022**	**0089_PW380_221212**	**Normal**	**EP2216877**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09	<1
PW381	**12/12/2022**	**0089_PW381_221212**	**Normal**	**EP2216877**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1
PW401	**12/12/2022**	**0089_PW401_221212**	**Normal**	**EP2216877**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1
PW405	**13/12/2022**	**0089_PW405_221213**	**Normal**	**EP2216930**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW407	**13/12/2022**	**0089_PW407_221213**	**Normal**	**EP2216930**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW409	**13/12/2022**	**0089_PW409_221213**	**Normal**	**EP2216934**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW411	**14/12/2022**	**0089_PW411_221214**	**Normal**	**EP2216973**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW413	**14/12/2022**	**0089_PW413_221214**	**Normal**	**EP2216973**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
PW415	**14/12/2022**	**0089_PW415_221214**	**Normal**	**EP2216973**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1
SW130	**12/12/2022**	**0089_SW130_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1
SW132	**12/12/2022**	**0089_QC104_221212**	**Field Duplicate**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1
SW132	**12/12/2022**	**0089_QC204_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1	
SW132	**12/12/2022**	**0089_SW132_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1
SW134	**12/12/2022**	**0089_QC112_221212**	**Field Duplicate**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1
SW134	**12/12/2022**	**0089_QC212_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.01	<0.05	<0.1	
SW134	**12/12/2022**	**0089_SW134_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1
SW150	**12/12/2022**	**0089_SW150_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW152	**12/12/2022**	**0089_SW152_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW154	**12/12/2022**	**0089_QC109_221212**	**Field Duplicate**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	
SW154	**12/12/2022**	**0089_QC209_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	
SW154	**12/12/2022**	**0089_SW154_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW156	**12/12/2022**	**0089_SW156_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW305	**12/12/2022**	**0089_SW305_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1
SW309	**13/12/2022**	**0089_SW309_221213**	**Normal**	**EP2217375**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW310	**13/12/2022**	**0089_SW310_221213**	**Normal**	**EP2216930**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW311	**13/12/2022**	**0089_SW311_221213**	**Normal**	**EP2216930**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW317	**13/12/2022**	**0089_SW317_221213**	**Normal**	**EP2216934**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW318	**13/12/2022**	**0089_SW318_221213**	**Normal**	**EP2216934**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW319	**13/12/2022**	**0089_SW319_221213**	**Normal**	**EP2216934**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW353	**12/12/2022**	**0089_SW353_221212**	**Normal**	**EP2216877**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW370	**12/12/2022**	**0089_SW370_221212**	**Normal**	**EP2216877**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1
SW371	**12/12/2022**	**0089_SW371_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1
SW372	**12/12/2022**	**0089_SW372_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.68*	0.68	0.68	<1
SW373	**12/12/2022**	**0089_SW373_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.26*	0.26	0.26	<1
SW382	**12/12/2022**	**0089_SW382_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	5
SW383	**12/12/2022**	**0089_SW383_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW384	**12/12/2022**	**0089_SW384_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW406	**13/12/2022**	**0089_SW406_221213**	**Normal**	**EP2216969**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW408	**13/12/2022**	**0089_SW408_221213**	**Normal**	**EP2216969**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW410	**13/12/2022**	**0089_SW410_221213**	**Normal**	**EP2216934**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW412	**14/12/2022**	**0089_SW412_221214**	**Normal**	**EP2216973**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW414	**14/12/2022**	**0089_SW414_221214**	**Normal**	**EP2216973**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1
SW416	**14/12/2022**	**0089_SW416_221214**	**Normal**	**EP2216973**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water

HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%

HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First-time detection of PFOA or PFHxS+PFOS

New exceedance of guideline value

					Inorganics								Metals			
					Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**												
MW109	**12/12/2022**	**0089_MW109_221212**	**Normal**	**EP2216902**	261	<1	271	8.04	7.94	77	0.64	22	83	15	<1	59
MW112	**12/12/2022**	**0089_MW112_221212**	**Normal**	**EP2216902**	224	<1	230	5.52	5.00	26	4.87	9	74	8	<1	15
MW120	**12/12/2022**	**0089_MW120_221212**	**Normal**	**EP2216902**	237	<1	248	6.80	6.91	50	0.80	21	76	19	3	34
MW121	**12/12/2022**	**0089_MW121_221212**	**Normal**	**EP2216902**	290	<1	301	6.67	4.94	19	14.9	6	72	10	2	11
MW123	**12/12/2022**	**0089_MW123_221212**	**Normal**	**EP2216902**	378	<1	378	10.2	10.0	87	0.87	9	95	21	1	81
MW123	**12/12/2022**	**0089_QC114_221212**	**Field Duplicate**	**EP2216902**												
MW123	**12/12/2022**	**0089_QC214_221212**	**Interlab Duplicate**	**950091**												
MW124	**12/12/2022**	**0089_MW124_221212**	**Normal**	**EP2216878**	423	<1	423	465	453	14,800	1.30	1,890	394	1,020	358	7,830
MW125	**12/12/2022**	**0089_MW125_221212**	**Normal**	**EP2216878**	407	<1	407	488	477	15,500	1.07	2,030	418	1,080	374	8,230
MW125	**12/12/2022**	**0089_QC103_221212**	**Field Duplicate**	**EP2216878**	399	<1	399	512	544	16,300	3.05	2,140	486	1,240	434	9,360
MW125	**12/12/2022**	**0089_QC203_221212**	**Interlab Duplicate**	**950091**												
MW126	**12/12/2022**	**0089_MW126_221212**	**Normal**	**EP2216878**	765	<1	765	495	448	15,900	4.95	1,510	384	1,070	335	7,650
MW127	**12/12/2022**	**0089_MW127_221212**	**Normal**	**EP2216878**	634	<1	634	445	477	14,000	3.45	1,820	412	1,140	365	8,130
MW127	**12/12/2022**	**0089_QC113_221212**	**Field Duplicate**	**EP2216878**	602	<1	602	453	421	14,400	3.73	1,680	357	1,010	322	7,160
MW127	**12/12/2022**	**0089_QC213_221212**	**Interlab Duplicate**	**950091**												
MW128	**12/12/2022**	**0089_MW128_221212**	**Normal**	**EP2216902**	410	<1	410	15.5	14.6	233	2.96	35	112	50	13	105
MW139	**12/12/2022**	**0089_MW139_221212**	**Normal**	**EP2216902**	160	<1	160	10.3	9.51	226	4.07	36	66	18	5	106
MW141	**12/12/2022**	**0089_MW141_221212**	**Normal**	**EP2216902**	526	<1	526	130	122	3,880	3.23	484	235	263	94	1,980
MW141	**12/12/2022**	**0089_QC101_221212**	**Field Duplicate**	**EP2216902**	543	<1	543	198	192	6,110	1.55	705	299	421	137	3,190
MW141	**12/12/2022**	**0089_QC201_221212**	**Interlab Duplicate**	**950091**												
MW142	**12/12/2022**	**0089_MW142_221212**	**Normal**	**EP2216902**	410	<1	410	287	283	9,020	0.84	1,190	332	629	216	4,800
MW149	**12/12/2022**	**0089_MW149_221212**	**Normal**	**EP2216902**	393	<1	393	224	199	6,870	6.03	1,090	197	452	169	3,390
MW158	**12/12/2022**	**0089_MW158_221212**	**Normal**	**EP2216876**	448	<1	448	144	134	4,430	3.63	493	190	320	100	2,200
MW161	**12/12/2022**	**0089_MW161_221212**	**Normal**	**EP2216876**	640	<1	640	34.8	27.9	609	11.0	230	65	67	35	419
MW166	**12/12/2022**	**0089_MW166_221212**	**Normal**	**EP2216876**	399	<1	399	39.7	36.4	995	4.39	176	128	91	34	497
MW171	**12/12/2022**	**0089_MW171_221212**	**Normal**	**EP2216876**	492	<1	492	134	128	4,060	2.17	468	176	311	88	2,110
MW172	**12/12/2022**	**0089_MW172_221212**	**Normal**	**EP2216876**	504	<1	504	50.9	48.6	1,300	2.27	198	108	129	45	723
MW173	**12/12/2022**	**0089_MW173_221212**	**Normal**	**EP2216876**	447	<1	447	34.6	30.6	822	6.11	117	127	83	24	386
MW193	**12/12/2022**	**0089_MW193_221212**	**Normal**	**EP2216876**	629	<1	629	25.3	19.6	389	12.7	86	105	59	14	211
MW195D	**12/12/2022**	**0089_MW195D_221212**	**Normal**	**EP2216876**	241	<1	241	326	326	10,200	0.06	1,600	353	739	250	5,550
MW195D	**12/12/2022**	**0089_QC111_221212**	**Field Duplicate**	**EP2216876**	248	<1	248	305	344	9,460	5.98	1,610	374	781	264	5,850
MW195D	**12/12/2022**	**0089_QC211_221212**	**Interlab Duplicate**	**950091**												
MW195S	**12/12/2022**	**0089_MW195S_221212**	**Normal**	**EP2216876**	576	<1	576	43.6	40.2	928	3.97	282	166	119	38	487
MW196	**13/12/2022**	**0089_MW196_221213**	**Normal**	**EP2216929**	225	<1	225	5.86	6.05	33	1.58	21	68	19	2	24
MW197	**12/12/2022**	**0089_MW197_221212**	**Normal**	**EP2216876**	574	<1	574	30.9	29.8	592	1.90	132	54	133	25	356
MW197	**12/12/2022**	**0089_QC115_221212**	**Field Duplicate**	**EP2216876**	566	<1	566	32.3	28.8	641	5.61	138	53	130	24	342
MW197	**12/12/2022**	**0089_QC215_221212**	**Interlab Duplicate**	**950091**												
MW199	**12/12/2022**	**0089_MW199_221212**	**Normal**	**EP2216876**	461	<1	461	53.8	49.1	1,450	4.61	179	81	97	36	831
MW199	**12/12/2022**	**0089_QC108_221212**	**Field Duplicate**	**EP2216876**	465	<1	465	63.7	58.4	1,780	4.36	202	90	113	43	1,000
MW199	**12/12/2022**	**0089_QC208_221212**	**Interlab Duplicate**	**950091**												
MW200	**12/12/2022**	**0089_MW200_221212**	**Normal**	**EP2216876**	436	<1	436	68.0	59.9	1,950	6.31	204	84	89	55	1,080
MW202	**12/12/2022**	**0089_MW202_221212**	**Normal**	**EP2216878**	392	<1	392	20.1	17.8	376	6.27	82	96	34	17	224
MW203	**12/12/2022**	**0089_MW203_221212**	**Normal**	**EP2216878**	310	<1	310	8.71	8.95	42	1.35	64	81	38	5	38
MW214	**13/12/2022**	**0089_MW214_221213**	**Normal**	**EP2216929**	424	<1	424	27.4	26.7	602	1.34	96	218	44	7	277
MW215	**13/12/2022**	**0089_MW215_221213**	**Normal**	**EP2216929**	304	<1	304	18.0	16.7	398	3.73	32	119	27	3	194
MW216	**13/12/2022**	**0089_MW216_221213**	**Normal**	**EP2216929**	264	<1	264	34.6	35.6	898	1.38	192	218	66	10	437
MW217	**13/12/2022**	**0089_MW217_221213**	**Normal**	**EP2216933**	288	<1	288	8.56	8.65	75	0.53	33	111	15	7	39
MW220	**13/12/2022**	**0089_MW220_221213**	**Normal**	**EP2216933**	259	<1	259	6.89	7.22	41	2.32	27	92	13	10	30
MW224	**13/12/2022**	**0089_MW224_221213**	**Normal**	**EP2216933**	220	<1	224	8.31	8.92	110	3.53	35	61	22	4	91
MW225	**13/12/2022**	**0089_MW225_221213**	**Normal**	**EP2216929**	343	<1	343	19.2	18.3	405	2.57	46	125	40	5	198
MW226	**13/12/2022**	**0089_MW226_221213**	**Normal**	**EP2216933**	592	<1	592	493	486	15,500	0.68	2,110	406	1,070	461	8,420
MW227	**13/12/2022**	**0089_MW227_221213**	**Normal**	**EP2216932**	381	<1	381	30.0	28.1	632	3.37	220	99	57	25	409
MW228	**13/12/2022**	**0089_MW228_221213**	**Normal**	**EP2216929**	659	<1	659	122	117	3,460	1.86	525	127	305	107	1,910
MW233	**13/12/2022**	**0089_MW233_221213**	**Normal**	**EP2216932**	152	<1	152	3.88	3.26	24	8.65	8	44	6	2	12
MW236	**13/12/2022**	**0089_MW236_221213**	**Normal**	**EP2216932**	253	<1	253	6.64	7.08	37	3.18	26	91	16	<1	28

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Table 1 - Water samples Analytical Results

					Inorganics								Metals			
					Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**												
MW238	**13/12/2022**	**0089_MW238_221213**	**Normal**	**EP2216932**	214	<1	214	6.17	6.90	34	5.59	45	88	15	4	27
MW239	**13/12/2022**	**0089_MW239_221213**	**Normal**	**EP2216932**	194	<1	194	5.42	5.80	37	3.44	24	80	10	3	21
MW240	**13/12/2022**	**0089_MW240_221213**	**Normal**	**EP2216932**	252	<1	252	6.94	7.32	41	2.66	36	106	10	3	26
MW242	**13/12/2022**	**0089_MW242_221213**	**Normal**	**EP2216932**	193	<1	193	4.79	4.57	14	2.37	26	65	10	1	11
MW243	**13/12/2022**	**0089_MW243_221213**	**Normal**	**EP2216932**	268	<1	268	8.17	9.52	65	7.64	47	125	18	4	39
MW245	**13/12/2022**	**0089_MW245_221213**	**Normal**	**EP2216932**	246	<1	246	5.92	5.63	34	2.44	2	83	8	2	18
MW249	**13/12/2022**	**0089_MW249_221213**	**Normal**	**EP2216932**	469	<1	469	13.7	11.7	115	7.95	53	91	37	6	91
MW255	**13/12/2022**	**0089_MW255_221213**	**Normal**	**EP2216932**	294	<1	294	9.13	8.98	88	0.79	37	102	17	4	55
MW256	**13/12/2022**	**0089_MW256_221213**	**Normal**	**EP2216932**	426	<1	426	19.6	17.8	347	4.86	64	138	38	9	174
MW257	**13/12/2022**	**0089_MW257_221213**	**Normal**	**EP2216932**	187	<1	191	5.23	5.32	34	0.85	22	66	8	6	28
MW258	**13/12/2022**	**0089_MW258_221213**	**Normal**	**EP2216932**	311	<1	311	12.0	13.5	139	5.91	91	141	34	14	77
MW259	**13/12/2022**	**0089_MW259_221213**	**Normal**	**EP2216932**	210	<1	210	5.28	5.00	32	2.74	9	68	9	<1	20
MW268	**13/12/2022**	**0089_MW268_221213**	**Normal**	**EP2216933**	434	<1	434	111	111	3,090	0.18	734	218	280	94	1,710
MW269	**13/12/2022**	**0089_MW269_221213**	**Normal**	**EP2216933**	350	<1	350	11.9	11.8	128	0.17	62	110	35	7	76
MW282	**13/12/2022**	**0089_MW282_221213**	**Normal**	**EP2216933**	430	<1	430	10.0	11.0	40	4.32	16	164	20	<1	26
MW288	**12/12/2022**	**0089_MW288_221212**	**Normal**	**EP2216878**	355	<1	355	9.55	8.99	68	3.01	26	100	25	3	43
MW289	**13/12/2022**	**0089_MW289_221213**	**Normal**	**EP2216932**	281	<1	285	9.41	9.63	91	1.17	55	83	22	6	81
MW496	**13/12/2022**	**0089_MW496_221213**	**Normal**	**EP2216932**	369	<1	374	14.8	13.4	185	4.84	99	76	41	12	136
MW500	**12/12/2022**	**0089_MW500_221212**	**Normal**	**EP2216902**	322	<1	322	7.39	6.56	20	5.96	19	96	12	<1	18
MW516	**13/12/2022**	**0089_MW516_221213**	**Normal**	**EP2216932**	400	<1	400	11.0	10.8	51	1.00	76	94	40	13	57
PW304	**12/12/2022**	**0089_PW304_221212**	**Normal**	**EP2216879**	456	<1	456	179	182	5,530	0.89	670	204	444	130	3,040
PW306	**13/12/2022**	**0089_PW306_221213**	**Normal**	**EP2217375**	134	<1	134	695	659	22,300	2.64	3,020	455	1,420	574	11,600
PW307	**13/12/2022**	**0089_PW307_221213**	**Normal**	**EP2217375**	130	<1	130	705	678	22,600	1.97	3,130	468	1,480	595	11,900
PW308	**13/12/2022**	**0089_PW308_221213**	**Normal**	**EP2217375**	124	<1	124	697	648	22,400	3.62	3,020	446	1,410	563	11,400
PW314	**13/12/2022**	**0089_PW314_221213**	**Normal**	**EP2217375**	121	<1	121	685	662	22,000	1.76	3,000	459	1,450	585	11,600
PW315	**13/12/2022**	**0089_PW315_221213**	**Normal**	**EP2217375**	128	<1	128	700	695	22,500	0.34	3,020	481	1,520	613	12,200
PW316	**13/12/2022**	**0089_PW316_221213**	**Normal**	**EP2217375**	130	<1	130	697	644	22,400	3.94	3,010	445	1,410	567	11,300
PW329	**12/12/2022**	**0089_PW329_221212**	**Normal**	**EP2216873**	180	<1	180	801	679	26,100	8.25	2,930	480	1,480	602	11,900
PW330	**12/12/2022**	**0089_PW330_221212**	**Normal**	**EP2216873**	192	<1	192	685	650	22,000	2.66	2,910	464	1,410	566	11,400
PW330	**12/12/2022**	**0089_QC105_221212**	**Field Duplicate**	**EP2216873**												
PW330	**12/12/2022**	**0089_QC205_221212**	**Interlab Duplicate**	**950091**												
PW331	**12/12/2022**	**0089_PW331_221212**	**Normal**	**EP2216873**	214	<1	214	657	676	21,000	1.48	2,880	471	1,460	587	11,900
PW335	**12/12/2022**	**0089_PW335_221212**	**Normal**	**EP2216879**	188	<1	188	580	653	18,700	5.98	2,320	446	1,430	513	11,500
PW340	**12/12/2022**	**0089_PW340_221212**	**Normal**	**EP2216879**	177	<1	177	623	642	20,200	1.52	2,370	451	1,400	495	11,300
PW341	**12/12/2022**	**0089_PW341_221212**	**Normal**	**EP2216879**	231	<1	231	613	654	19,800	3.21	2,390	466	1,420	515	11,500
PW345	**13/12/2022**	**0089_PW345_221213**	**Normal**	**EP2216930**	286	<1	286	491	477	15,700	1.39	2,020	367	1,040	411	8,340
PW346	**12/12/2022**	**0089_PW346_221212**	**Normal**	**EP2216879**	242	<1	246	17.0	14.4	298	8.56	179	30	38	15	215
PW346	**12/12/2022**	**0089_QC118_221212**	**Field Duplicate**	**EP2216879**	237	<1	242	16.2	13.6	268	8.60	181	30	36	14	202
PW346	**12/12/2022**	**0089_QC218_221212**	**Interlab Duplicate**	**950091**												
PW350	**12/12/2022**	**0089_PW350_221212**	**Normal**	**EP2216877**	134	<1	134	668	614	21,500	4.18	2,840	419	1,340	533	10,800
PW351	**12/12/2022**	**0089_PW351_221212**	**Normal**	**EP2216873**	136	<1	136	698	667	22,500	2.23	2,900	466	1,460	588	11,700
PW352	**12/12/2022**	**0089_PW352_221212**	**Normal**	**EP2216877**	120	<1	120	677	694	21,800	1.25	2,850	472	1,510	601	12,200
PW356	**12/12/2022**	**0089_PW356_221212**	**Normal**	**EP2216873**	178	<1	178	677	719	21,700	2.99	2,950	508	1,570	634	12,600
PW357	**12/12/2022**	**0089_PW357_221212**	**Normal**	**EP2216873**	171	<1	171	606	674	19,300	5.28	2,810	463	1,440	574	11,900
PW358	**12/12/2022**	**0089_PW358_221212**	**Normal**	**EP2216873**	273	<1	273	691	672	22,100	1.36	2,970	492	1,450	589	11,800
PW362	**12/12/2022**	**0089_PW362_221212**	**Normal**	**EP2216879**	168	<1	168	573	613	18,500	3.44	2,280	424	1,340	480	10,800
PW362	**12/12/2022**	**0089_QC107_221212**	**Field Duplicate**	**EP2216879**	168	<1	168	561	623	18,100	5.23	2,280	429	1,350	485	11,000
PW362	**12/12/2022**	**0089_QC207_221212**	**Interlab Duplicate**	**950091**												
PW363	**12/12/2022**	**0089_PW363_221212**	**Normal**	**EP2216879**	199	<1	199	667	637	21,800	2.34	2,330	454	1,390	496	11,200
PW364	**12/12/2022**	**0089_PW364_221212**	**Normal**	**EP2216879**	182	<1	182	615	668	19,900	4.19	2,390	453	1,450	519	11,800
PW367	**13/12/2022**	**0089_PW367_221213**	**Normal**	**EP2216930**	470	<1	470	391	364	12,300	3.54	1,650	305	828	309	6,270
PW368	**12/12/2022**	**0089_PW368_221212**	**Normal**	**EP2216879**	314	<1	314	509	498	16,200	1.10	2,210	409	1,120	365	8,650
PW368	**12/12/2022**	**0089_QC116_221212**	**Field Duplicate**	**EP2216879**	308	<1	308	515	491	16,400	2.39	2,220	395	1,100	360	8,540
PW368	**12/12/2022**	**0089_QC216_221212**	**Interlab Duplicate**	**950091**												
PW369	**13/12/2022**	**0089_PW369_221213**	**Normal**	**EP2216930**	330	<1	330	558	560	17,900	0.14	2,250	418	1,230	489	9,780
PW374	**13/12/2022**	**0089_PW374_221213**	**Normal**	**EP2216934**	124	<1	124	636	659	20,600	1.80	2,510	437	1,430	589	11,600
PW375	**13/12/2022**	**0089_PW375_221213**	**Normal**	**EP2217375**	116	<1	116	680	655	21,800	1.90	3,030	451	1,430	572	11,500

Table 1 - Water samples Analytical Results

				Inorganics								Metals			
				Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
				mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting				1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water															
PFAS NEMP 2020 Interim Marine 99%															
PFAS NEMP 2020 Recreational Water															
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
PW378	**13/12/2022**	**0089_PW378_221213**	**Normal**	**EP2216934**	119	<1	119	661	658	21,500	0.20	2,510	444	1,420	580	11,600
PW380	**12/12/2022**	**0089_PW380_221212**	**Normal**	**EP2216877**	131	<1	131	683	666	22,000	1.31	2,880	453	1,450	574	11,700
PW381	**12/12/2022**	**0089_PW381_221212**	**Normal**	**EP2216877**	124	<1	124	681	647	22,000	2.58	2,800	435	1,400	557	11,400
PW401	**12/12/2022**	**0089_PW401_221212**	**Normal**	**EP2216877**	128	<1	128	673	615	21,700	4.51	2,820	419	1,350	526	10,800
PW405	**13/12/2022**	**0089_PW405_221213**	**Normal**	**EP2216930**	155	<1	155	648	684	20,900	2.75	2,650	486	1,490	610	12,000
PW407	**13/12/2022**	**0089_PW407_221213**	**Normal**	**EP2216930**	194	<1	194	600	703	19,000	7.96	2,870	496	1,550	624	12,300
PW409	**13/12/2022**	**0089_PW409_221213**	**Normal**	**EP2216934**	152	<1	152	658	721	21,300	4.59	2,590	492	1,550	646	12,700
PW411	**14/12/2022**	**0089_PW411_221214**	**Normal**	**EP2216973**	115	<1	115	634	649	20,500	1.10	2,590	448	1,410	563	11,400
PW413	**14/12/2022**	**0089_PW413_221214**	**Normal**	**EP2216973**	116	<1	116	642	706	20,800	4.74	2,560	487	1,540	623	12,400
PW415	**14/12/2022**	**0089_PW415_221214**	**Normal**	**EP2216973**	161	<1	161	594	664	19,200	5.52	2,380	481	1,460	592	11,600
SW130	**12/12/2022**	**0089_SW130_221212**	**Normal**	**EP2216879**	148	<1	148	636	687	20,600	3.82	2,510	476	1,480	585	12,100
SW132	**12/12/2022**	**0089_QC104_221212**	**Field Duplicate**	**EP2216879**	135	<1	135	632	715	20,500	6.17	2,440	481	1,560	564	12,600
SW132	**12/12/2022**	**0089_QC204_221212**	**Interlab Duplicate**	**950091**												
SW132	**12/12/2022**	**0089_SW132_221212**	**Normal**	**EP2216879**	138	<1	138	635	685	20,600	3.81	2,460	457	1,490	535	12,100
SW134	**12/12/2022**	**0089_QC112_221212**	**Field Duplicate**	**EP2216879**	139	<1	139	632	675	20,500	3.26	2,450	451	1,470	529	11,900
SW134	**12/12/2022**	**0089_QC212_221212**	**Interlab Duplicate**	**950091**												
SW134	**12/12/2022**	**0089_SW134_221212**	**Normal**	**EP2216879**	136	<1	136	629	704	20,400	5.59	2,460	473	1,540	555	12,400
SW150	**12/12/2022**	**0089_SW150_221212**	**Normal**	**EP2216873**	133	<1	133	594	657	19,000	5.03	2,650	453	1,400	561	11,600
SW152	**12/12/2022**	**0089_SW152_221212**	**Normal**	**EP2216873**	139	<1	139	656	671	21,100	1.08	2,810	466	1,450	584	11,800
SW154	**12/12/2022**	**0089_QC109_221212**	**Field Duplicate**	**EP2216873**												
SW154	**12/12/2022**	**0089_QC209_221212**	**Interlab Duplicate**	**950091**												
SW154	**12/12/2022**	**0089_SW154_221212**	**Normal**	**EP2216873**	133	<1	133	684	658	22,100	1.97	2,780	450	1,410	566	11,600
SW156	**12/12/2022**	**0089_SW156_221212**	**Normal**	**EP2216873**	131	<1	131	652	638	20,900	1.10	2,900	452	1,390	557	11,200
SW305	**12/12/2022**	**0089_SW305_221212**	**Normal**	**EP2216879**	149	<1	149	682	679	22,300	0.19	2,400	457	1,470	533	12,000
SW309	**13/12/2022**	**0089_SW309_221213**	**Normal**	**EP2217375**	117	<1	117	694	649	22,300	3.35	2,990	447	1,410	567	11,400
SW310	**13/12/2022**	**0089_SW310_221213**	**Normal**	**EP2216930**	120	<1	120	626	666	20,200	3.13	2,560	455	1,450	586	11,700
SW311	**13/12/2022**	**0089_SW311_221213**	**Normal**	**EP2216930**	118	<1	118	626	636	20,200	0.73	2,600	428	1,370	556	11,200
SW317	**13/12/2022**	**0089_SW317_221213**	**Normal**	**EP2216934**	120	<1	120	650	648	21,100	0.14	2,530	438	1,410	572	11,400
SW318	**13/12/2022**	**0089_SW318_221213**	**Normal**	**EP2216934**	122	<1	122	636	705	20,600	5.18	2,510	477	1,530	634	12,400
SW319	**13/12/2022**	**0089_SW319_221213**	**Normal**	**EP2216934**	123	<1	123	633	669	20,500	2.73	2,530	443	1,440	592	11,800
SW353	**12/12/2022**	**0089_SW353_221212**	**Normal**	**EP2216877**	127	<1	127	656	620	21,200	2.82	2,640	416	1,350	533	10,900
SW370	**12/12/2022**	**0089_SW370_221212**	**Normal**	**EP2216877**	148	<1	148	649	667	20,900	1.36	2,720	464	1,460	582	11,700
SW371	**12/12/2022**	**0089_SW371_221212**	**Normal**	**EP2216879**	143	<1	143	728	658	22,600	5.07	4,210	446	1,430	516	11,600
SW372	**12/12/2022**	**0089_SW372_221212**	**Normal**	**EP2216879**	152	<1	152	621	654	20,000	2.60	2,580	455	1,420	560	11,500
SW373	**12/12/2022**	**0089_SW373_221212**	**Normal**	**EP2216879**	142	<1	142	726	659	22,600	4.79	4,100	444	1,450	518	11,600
SW382	**12/12/2022**	**0089_SW382_221212**	**Normal**	**EP2216873**	118	<1	123	667	688	21,500	1.52	2,800	474	1,490	596	12,100
SW383	**12/12/2022**	**0089_SW383_221212**	**Normal**	**EP2216873**	125	<1	125	685	672	22,100	0.94	2,830	458	1,470	586	11,800
SW384	**12/12/2022**	**0089_SW384_221212**	**Normal**	**EP2216873**	125	<1	125	668	638	21,500	2.28	2,820	443	1,390	557	11,200
SW406	**13/12/2022**	**0089_SW406_221213**	**Normal**	**EP2216969**	125	<1	125	700	665	22,500	2.51	3,000	462	1,440	583	11,700
SW408	**13/12/2022**	**0089_SW408_221213**	**Normal**	**EP2216969**	129	<1	129	690	631	22,200	4.49	2,940	437	1,360	554	11,100
SW410	**13/12/2022**	**0089_SW410_221213**	**Normal**	**EP2216934**	147	<1	147	646	660	20,900	1.07	2,570	451	1,430	594	11,600
SW412	**14/12/2022**	**0089_SW412_221214**	**Normal**	**EP2216973**	119	<1	119	637	690	20,600	4.01	2,560	478	1,510	609	12,100
SW414	**14/12/2022**	**0089_SW414_221214**	**Normal**	**EP2216973**	123	<1	123	634	706	20,500	5.36	2,570	487	1,540	616	12,400
SW416	**14/12/2022**	**0089_SW416_221214**	**Normal**	**EP2216973**	124	<1	124	646	690	20,900	3.35	2,570	480	1,510	614	12,100

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water

HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%

HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First-time detection of PFOA or PFHxS+PFOS

New exceedance of guideline value

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting							0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005
PFAS NEMP 2020 Ecological direct exposure											1						10						
PFAS NEMP 2020 Ecological indirect exposure											*0.01*												
PFAS NEMP 2020 Industrial/ commercial (HIL D)																	**50**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																		
WWTP	**SD304**	**12/12/2022**	**0089_SD304_221212**	**Normal**	**EP2216880**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter support area	**SD306**	**13/12/2022**	**0089_SD306_221212**	**Normal**	**EP2216931**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter support area	**SD307**	**13/12/2022**	**0089_SD307_221212**	**Normal**	**EP2216931**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter support area	**SD308**	**13/12/2022**	**0089_SD308_221212**	**Normal**	**EP2216931**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter support area	**SD314**	**13/12/2022**	**0089_SD314_221212**	**Normal**	**EP2216931**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter support area	**SD315**	**13/12/2022**	**0089_SD315_221212**	**Normal**	**EP2216931**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter support area	**SD316**	**13/12/2022**	**0089_SD316_221212**	**Normal**	**EP2216931**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD329**	**12/12/2022**	**0089_SD329_221212**	**Normal**	**EP2216874**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD330**	**12/12/2022**	**0089_QC106_221212**	**Field Duplicate**	**EP2216874**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD330**	**12/12/2022**	**0089_QC206_221212**	**Interlab Duplicate**	**950091**		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fire Training Area	**SD330**	**12/12/2022**	**0089_SD330_221212**	**Normal**	**EP2216874**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training Area	**SD331**	**12/12/2022**	**0089_SD331_221212**	**Normal**	**EP2216874**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training Area	**SD335**	**12/12/2022**	**0089_SD335_221212**	**Normal**	**EP2216880**		<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training Area	**SD340**	**12/12/2022**	**0089_SD340_221212**	**Normal**	**EP2216880**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training Area	**SD341**	**12/12/2022**	**0089_QC110_221212**	**Field Duplicate**	**EP2216880**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD341**	**12/12/2022**	**0089_QC210_221212**	**Interlab Duplicate**	**950091**		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Accomodation Area	**SD341**	**12/12/2022**	**0089_SD341_221212**	**Normal**	**EP2216880**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**13/12/2022**	**0089_SD345_221212**	**Normal**	**EP2216931**		<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD346**	**12/12/2022**	**0089_SD346_221212**	**Normal**	**EP2216880**		<0.0002	<0.0002	0.0002	<0.0002	0.0097	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**12/12/2022**	**0089_SD350_221212**	**Normal**	**EP2216875**		<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD351**	**12/12/2022**	**0089_SD351_221212**	**Normal**	**EP2216874**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD352**	**12/12/2022**	**0089_SD352_221212**	**Normal**	**EP2216874**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD356**	**12/12/2022**	**0089_SD356_221212**	**Normal**	**EP2216874**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD357**	**12/12/2022**	**0089_SD357_221212**	**Normal**	**EP2216874**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD358**	**12/12/2022**	**0089_SD358_221212**	**Normal**	**EP2216874**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training	**SD362**	**12/12/2022**	**0089_SD362_221212**	**Normal**	**EP2216880**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training	**SD363**	**12/12/2022**	**0089_SD363_221212**	**Normal**	**EP2216880**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training	**SD364**	**12/12/2022**	**0089_QC102_221212**	**Field Duplicate**	**EP2216880**		<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training	**SD364**	**12/12/2022**	**0089_QC202_221212**	**Interlab Duplicate**	**950091**		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fire Training	**SD364**	**12/12/2022**	**0089_SD364_221212**	**Normal**	**EP2216880**		<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD367**	**13/12/2022**	**0089_SD367_221212**	**Normal**	**EP2216931**		<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD368**	**12/12/2022**	**0089_QC117_221212**	**Field Duplicate**	**EP2216880**		<0.0002	<0.0002	<0.0002	<0.0002	0.0009	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD368**	**12/12/2022**	**0089_QC217_221212**	**Interlab Duplicate**	**950091**		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WWTP	**SD368**	**12/12/2022**	**0089_SD368_221212**	**Normal**	**EP2216880**		<0.0002	<0.0002	<0.0002	<0.0002	0.0009	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD369**	**13/12/2022**	**0089_SD369_221212**	**Normal**	**EP2216931**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and careening bay	**SD374**	**13/12/2022**	**0089_SD374_221212**	**Normal**	**EP2216935**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and careening bay	**SD375**	**13/12/2022**	**0089_SD375_221212**	**Normal**	**EP2216935**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and careening bay	**SD378**	**13/12/2022**	**0089_SD378_221212**	**Normal**	**EP2216935**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**12/12/2022**	**0089_SD380_221212**	**Normal**	**EP2216875**		<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD381**	**12/12/2022**	**0089_SD381_221212**	**Normal**	**EP2216875**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD401**	**12/12/2022**	**0089_SD401_221212**	**Normal**	**EP2216875**		<0.0002	<0.0002	<0.0002	<0.0002	0.0015	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter support area	**SD405**	**13/12/2022**	**0089_SD405_221212**	**Normal**	**EP2216935**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter support area	**SD407**	**13/12/2022**	**0089_SD407_221212**	**Normal**	**EP2216931**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter support area	**SD409**	**13/12/2022**	**0089_SD409_221212**	**Normal**	**EP2216935**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter support area	**SD411**	**14/12/2022**	**0089_SD411_221214**	**Normal**	**EP2216974**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter support area	**SD413**	**14/12/2022**	**0089_SD413_221214**	**Normal**	**EP2216974**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter support area	**SD415**	**14/12/2022**	**0089_SD415_221214**	**Normal**	**EP2216974**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure
HEPA, January 2020, PFAS NEMP 2020 Industrial/ commercial (HIL D)

Notes:

First-time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0005	0.0005	0.0005	0.0005	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0002	0.0002
PFAS NEMP 2020 Ecological direct exposure																			
PFAS NEMP 2020 Ecological indirect exposure																			
PFAS NEMP 2020 Industrial/ commercial (HIL D)																	**20**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
WWTP	**SD304**	**12/12/2022**	**0089_SD304_221212**	**Normal**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD306**	**13/12/2022**	**0089_SD306_221212**	**Normal**	**EP2216931**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD307**	**13/12/2022**	**0089_SD307_221212**	**Normal**	**EP2216931**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD308**	**13/12/2022**	**0089_SD308_221212**	**Normal**	**EP2216931**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD314**	**13/12/2022**	**0089_SD314_221212**	**Normal**	**EP2216931**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD315**	**13/12/2022**	**0089_SD315_221212**	**Normal**	**EP2216931**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD316**	**13/12/2022**	**0089_SD316_221212**	**Normal**	**EP2216931**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD329**	**12/12/2022**	**0089_SD329_221212**	**Normal**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD330**	**12/12/2022**	**0089_QC106_221212**	**Field Duplicate**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD330**	**12/12/2022**	**0089_QC206_221212**	**Interlab Duplicate**	**950091**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Fire Training Area	**SD330**	**12/12/2022**	**0089_SD330_221212**	**Normal**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training Area	**SD331**	**12/12/2022**	**0089_SD331_221212**	**Normal**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training Area	**SD335**	**12/12/2022**	**0089_SD335_221212**	**Normal**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Fire Training Area	**SD340**	**12/12/2022**	**0089_SD340_221212**	**Normal**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training Area	**SD341**	**12/12/2022**	**0089_QC110_221212**	**Field Duplicate**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD341**	**12/12/2022**	**0089_QC210_221212**	**Interlab Duplicate**	**950091**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Accomodation Area	**SD341**	**12/12/2022**	**0089_SD341_221212**	**Normal**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD345**	**13/12/2022**	**0089_SD345_221212**	**Normal**	**EP2216931**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	**SD346**	**12/12/2022**	**0089_SD346_221212**	**Normal**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0099	0.0099	0.0099
WWTP	**SD350**	**12/12/2022**	**0089_SD350_221212**	**Normal**	**EP2216875**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
Demolition ground	**SD351**	**12/12/2022**	**0089_SD351_221212**	**Normal**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD352**	**12/12/2022**	**0089_SD352_221212**	**Normal**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD356**	**12/12/2022**	**0089_SD356_221212**	**Normal**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD357**	**12/12/2022**	**0089_SD357_221212**	**Normal**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD358**	**12/12/2022**	**0089_SD358_221212**	**Normal**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training	**SD362**	**12/12/2022**	**0089_SD362_221212**	**Normal**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training	**SD363**	**12/12/2022**	**0089_SD363_221212**	**Normal**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training	**SD364**	**12/12/2022**	**0089_QC102_221212**	**Field Duplicate**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
Fire Training	**SD364**	**12/12/2022**	**0089_QC202_221212**	**Interlab Duplicate**	**950091**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Fire Training	**SD364**	**12/12/2022**	**0089_SD364_221212**	**Normal**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
WWTP	**SD367**	**13/12/2022**	**0089_SD367_221212**	**Normal**	**EP2216931**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	**SD368**	**12/12/2022**	**0089_QC117_221212**	**Field Duplicate**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0009	0.0009	0.0009
WWTP	**SD368**	**12/12/2022**	**0089_QC217_221212**	**Interlab Duplicate**	**950091**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
WWTP	**SD368**	**12/12/2022**	**0089_SD368_221212**	**Normal**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0009	0.0009	0.0009
WWTP	**SD369**	**13/12/2022**	**0089_SD369_221212**	**Normal**	**EP2216931**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and careening bay	**SD374**	**13/12/2022**	**0089_SD374_221212**	**Normal**	**EP2216935**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and careening bay	**SD375**	**13/12/2022**	**0089_SD375_221212**	**Normal**	**EP2216935**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and careening bay	**SD378**	**13/12/2022**	**0089_SD378_221212**	**Normal**	**EP2216935**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**12/12/2022**	**0089_SD380_221212**	**Normal**	**EP2216875**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
WWTP	**SD381**	**12/12/2022**	**0089_SD381_221212**	**Normal**	**EP2216875**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD401**	**12/12/2022**	**0089_SD401_221212**	**Normal**	**EP2216875**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0015	0.0015	0.0015
Helicopter support area	**SD405**	**13/12/2022**	**0089_SD405_221212**	**Normal**	**EP2216935**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD407**	**13/12/2022**	**0089_SD407_221212**	**Normal**	**EP2216931**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD409**	**13/12/2022**	**0089_SD409_221212**	**Normal**	**EP2216935**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD411**	**14/12/2022**	**0089_SD411_221214**	**Normal**	**EP2216974**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD413**	**14/12/2022**	**0089_SD413_221214**	**Normal**	**EP2216974**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD415**	**14/12/2022**	**0089_SD415_221214**	**Normal**	**EP2216974**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure
HEPA, January 2020, PFAS NEMP 2020 Industrial/ commercial (HIL D)

Notes:

First-time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

				PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS -
				Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting				0.02	0.02	0.01	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.05	0.05
Date	**Field ID**	**Sample Type**	**Lab Report No.**																		
12/12/2022	**0089_QC301_221212**	**Rinsate**	**EP2216902**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
12/12/2022	**0089_QC302_221212**	**Rinsate**	**EP2216902**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
12/12/2022	**0089_QC303_221212**	**Rinsate**	**EP2216902**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
12/12/2022	**0089_QC401_221212**	**Field Blank**	**EP2216902**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
12/12/2022	**0089_QC402_221212**	**Field Blank**	**EP2216902**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
12/12/2022	**0089_QC403_221212**	**Field Blank**	**EP2216902**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
13/12/2022	**0089_QC301_221213**	**Rinsate**	**EP2216969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
13/12/2022	**0089_QC302_221213**	**Rinsate**	**EP2216969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
13/12/2022	**0089_QC303_221213**	**Rinsate**	**EP2216969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
13/12/2022	**0089_QC401_221213**	**Field Blank**	**EP2216969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
13/12/2022	**0089_QC402_221213**	**Field Blank**	**EP2216969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
13/12/2022	**0089_QC403_221213**	**Field Blank**	**EP2216969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
14/12/2022	**0089_QC301_221214**	**Rinsate**	**EP2216975**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
14/12/2022	**0089_QC401_221214**	**Field Blank**	**EP2216975**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05

				PFAS - n:2) Fluorotelomer Sulfonic Acids					PFAS - Perfluoroalkyl Sulfonamides							PFAS		
				Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting				0.02	0.02	0.05	0.05	0.05	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01
Date	**Field ID**	**Sample Type**	**Lab Report No.**															
12/12/2022	**0089_QC301_221212**	**Rinsate**	**EP2216902**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
12/12/2022	**0089_QC302_221212**	**Rinsate**	**EP2216902**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
12/12/2022	**0089_QC303_221212**	**Rinsate**	**EP2216902**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
12/12/2022	**0089_QC401_221212**	**Field Blank**	**EP2216902**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
12/12/2022	**0089_QC402_221212**	**Field Blank**	**EP2216902**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
12/12/2022	**0089_QC403_221212**	**Field Blank**	**EP2216902**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
13/12/2022	**0089_QC301_221213**	**Rinsate**	**EP2216969**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
13/12/2022	**0089_QC302_221213**	**Rinsate**	**EP2216969**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
13/12/2022	**0089_QC303_221213**	**Rinsate**	**EP2216969**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
13/12/2022	**0089_QC401_221213**	**Field Blank**	**EP2216969**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
13/12/2022	**0089_QC402_221213**	**Field Blank**	**EP2216969**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
13/12/2022	**0089_QC403_221213**	**Field Blank**	**EP2216969**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
14/12/2022	**0089_QC301_221214**	**Rinsate**	**EP2216975**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
14/12/2022	**0089_QC401_221214**	**Field Blank**	**EP2216975**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01

			Date	12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022	
			Field ID	0089_MW141_221212	0089_QC101_221212		0089_MW141_221212	0089_QC201_221212		0089_MW125_221212	0089_QC103_221212	
			Matrix Type	Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2216902	EP2216902	RPD	EP2216902	950091	RPD	EP2216878	EP2216878	RPD
	Unit	LOR										
PFAS - Perfluoroalkyl Sulfonic Acids												
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0.33	0.38	14	0.33	0.45	**31**	0.19	0.19	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0.94	1.05	11	0.94	0.60	**44**	0.19	0.21	10
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	15.0	17.5	15	15.0	13	14	0.69	0.74	7
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	1.42	1.54	8	1.42	0.78	**58**	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	129	140	8	129	91	**35**	<0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids												
Perfluorobutanoic acid (PFBA)	µg/L	0.05	0.2	0.2	0	0.2	0.22	10	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0.76	0.79	4	0.76	0.58	**27**	0.04	0.04	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	5.86	6.04	3	5.86	6.4	9	0.18	0.15	18
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	0.30	0.33	10	0.30	0.31	3	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.99	1.07	8	0.99	1.2	19	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	0.03	0.04	29	0.03	0.04	29	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.25	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids												
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides												
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS												
Sum of PFHxS and PFOS	µg/L	0.01	144	158	9	144	104	**32**	0.69	0.74	7
Sum of PFAS (WA DER List)	µg/L	0.01	152	166	9	152	113.16	**29**	1.10	1.12	2
Sum of PFAS	µg/L	0.01	155	169	9	155	114.8	**30**	1.29	1.33	3

***RPDs have only been considered where a concentration is greater than 1 times the LOR.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: Ni Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

			Date	12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022	
			Field ID	0089_MW125_221212	0089_QC203_221212		0089_SW132_221212	0089_QC104_221212		0089_SW132_221212	0089_QC204_221212		0089_PW362_221212	0089_QC107_221212	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2216878	950091	RPD	EP2216879	EP2216879	RPD	EP2216879	950091	RPD	EP2216879	EP2216879	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0.19	0.15	24	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0.19	0.15	24	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.69	0.61	12	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	0.02	0.02	0	0.02	0.02	0	<0.01	0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0.04	0.03	29	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0.18	0.21	15	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01	0.69	0.61	12	0.02	0.02	0	0.02	0.02	0	<0.01	0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	1.10	1.01	9	0.02	0.02	0	0.02	<0.05	0	<0.01	0.01	0
Sum of PFAS	µg/L	0.01	1.29	1.21	6	0.02	0.02	0	0.02	<0.1	0	<0.01	0.01	0

			Date	12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022	
			Field ID	0089_PW362_221212	0089_QC207_221212		0089_PW330_221212	0089_QC105_221212		0089_PW330_221212	0089_QC205_221212		0089_MW199_221212	0089_QC108_221212	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2216879	950091	RPD	EP2216873	EP2216873	RPD	EP2216873	950091	RPD	EP2216876	EP2216876	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05		<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01		<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0
Sum of PFAS	µg/L	0.01		<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0

			Date	12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022	
			Field ID	0089_MW199_221212	0089_QC208_221212		0089_SW154_221212	0089_QC109_221212		0089_SW154_221212	0089_QC209_221212		0089_MW195D_221212	0089_QC111_221212	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2216876	950091	RPD	EP2216873	EP2216873	RPD	EP2216873	950091	RPD	EP2216876	EP2216876	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	0.01	0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05		<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	0.01	0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01		<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0	0.01	0.01	0
Sum of PFAS	µg/L	0.01		<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0	0.01	0.01	0

			Date	12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022	
			Field ID	0089_MW195D_221212	0089_QC211_221212		0089_SW134_221212	0089_QC112_221212		0089_SW134_221212	0089_QC212_221212		0089_MW127_221212	0089_QC113_221212	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2216876	950091	RPD	EP2216879	EP2216879	RPD	EP2216879	950091	RPD	EP2216878	EP2216878	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		0.01	0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01		<0.01	<0.01	0	0.02	0.02	0	0.02	0.01	67	<0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05		<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01		0.01	0.01	0	0.02	0.02	0	0.02	0.01	67	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01		0.01	<0.05	0	0.02	0.02	0	0.02	<0.05	0	<0.01	<0.01	0
Sum of PFAS	µg/L	0.01		0.01	<0.1	0	0.02	0.02	0	0.02	<0.1	0	<0.01	<0.01	0

			Date	12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022	
			Field ID	0089_MW127_221212	0089_QC213_221212		0089_MW123_221212	0089_QC114_221212		0089_MW123_221212	0089_QC214_221212		0089_MW197_221212	0089_QC115_221212	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2216878	950091	RPD	EP2216902	EP2216902	RPD	EP2216902	950091	RPD	EP2216876	EP2216876	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.01	0	0.08	0.09	12	0.08	0.08	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	0.06	0.06	0	0.06	0.05	18	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	0.01	0.01	0	0.01	0.01	0	<0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.01	0	0.02	0.02	0	0.02	0.02	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	0.07	0.07	0	0.07	0.06	15	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.05	0	0.17	0.18	6	0.17	0.16	6	<0.01	<0.01	0
Sum of PFAS	µg/L	0.01	<0.01	<0.1	0	0.17	0.18	6	0.17	0.18	6	<0.01	<0.01	0

			Date	12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022	
			Field ID	0089_MW197_221212	0089_QC215_221212		0089_PW368_221212	0089_QC116_221212		0089_PW368_221212	0089_QC216_221212	
			Matrix Type	Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2216876	950091	RPD	EP2216879	EP2216879	RPD	EP2216879	950091	RPD
	Unit	LOR										
PFAS - Perfluoroalkyl Sulfonic Acids												
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01		<0.01	<0.01	0	0.26	0.22	17	0.26	0.27	4
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids												
Perfluorobutanoic acid (PFBA)	µg/L	0.05		<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids												
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides												
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS												
Sum of PFHxS and PFOS	µg/L	0.01		<0.01	<0.01	0	0.26	0.22	17	0.26	0.28	7
Sum of PFAS (WA DER List)	µg/L	0.01		<0.01	<0.05	0	0.26	0.22	17	0.26	0.28	7
Sum of PFAS	µg/L	0.01		<0.01	<0.1	0	0.26	0.22	17	0.26	0.28	7

			Date	12/12/2022	12/12/2022		12/12/2022	12/12/2022	
			Field ID	0089_PW346_221212	0089_QC118_221212		0089_PW346_221212	0089_QC218_221212	
			Matrix Type	Water	Water		Water	Water	
			Lab Report Number	EP2216879	EP2216879	RPD	EP2216879	950091	RPD
	Unit	LOR							
PFAS - Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0.04	0.06	40	0.04	0.05	22
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0.04	0.05	22	0.04	0.04	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.33	0.44	**29**	0.33	0.42	**24**
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	0.05	0.07	33	0.05	0.09	57
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	5.54	6.88	**22**	5.54	7.1	**25**
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0.03	0.05	50	0.03	0.04	29
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0.07	0.10	35	0.07	0.10	35
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	0.02	0	<0.02	0.03	40
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.03	0.05	50	0.03	0.06	67
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	0.02	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
PFAS									
Sum of PFHxS and PFOS	µg/L	0.01	5.87	7.32	**22**	5.87	7.52	**25**
Sum of PFAS (WA DER List)	µg/L	0.01	6.04	7.60	**23**	6.04	7.82	**26**
Sum of PFAS	µg/L	0.01	6.13	7.72	**23**	6.13	7.98	**26**

		Date	12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022	
		Field ID	0089_SD364_221212	0089_QC102_221212		0089_SD364_221212	0089_QC202_221212		0089_SD330_221212	0089_QC106_221212	
		Matrix Type	Sediment	Sediment		Sediment	Sediment		Sediment	Sediment	
		Lab Report Number	EP2216880	EP2216880	RPD	EP2216880	950091	RPD	EP2216874	EP2216874	RPD
	Unit	LOR									
PFAS - Perfluoroalkyl Sulfonic Acids											
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0.0002	0.0002	0	0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
PFAS - Perfluoroalkyl Carboxylic Acids											
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids											
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0
PFAS - Perfluoroalkyl Sulfonamides											
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0
PFAS											
Sum of PFHxS and PFOS	mg/kg	0.0002	0.0002	0.0002	0	0.0002	<0.005	0	<0.0002	<0.0002	0
Sum of PFAS (WA DER List)	mg/kg	0.0002	0.0002	0.0002	0	0.0002	<0.01	0	<0.0002	<0.0002	0
Sum of PFAS	mg/kg	0.0002	0.0002	0.0002	0	0.0002	<0.05	0	<0.0002	<0.0002	0

*RPDs have only been considered where a concentration is greater than 1 times the LOR.
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

	Date	12/12/2022	12/12/2022		12/12/2022	12/12/2022		12/12/2022	12/12/2022	
	Field ID	0089_SD330_221212	0089_QC206_221212		0089_SD341_221212	0089_QC110_221212		0089_SD341_221212	0089_QC210_221212	
	Matrix Type	Sediment	Sediment		Sediment	Sediment		Sediment	Sediment	
	Lab Report Number	EP2216874	950091	RPD	EP2216880	EP2216880	RPD	EP2216880	950091	RPD
	Unit	LOR								
PFAS - Perfluoroalkyl Sulfonic Acids										
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids										
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids										
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides										
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS										
Sum of PFHxS and PFOS	mg/kg	0.0002	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
Sum of PFAS	mg/kg	0.0002	<0.0002	<0.05	0	<0.0002	<0.0002	0	<0.0002	<0.05	0

		Date	12/12/2022	12/12/2022		12/12/2022	12/12/2022	
		Field ID	0089_SD368_221212	0089_QC117_221212		0089_SD368_221212	0089_QC217_221212	
		Matrix Type	Sediment	Sediment		Sediment	Sediment	
		Lab Report Number	EP2216880	EP2216880	RPD	EP2216880	950091	RPD
	Unit	LOR						
PFAS - Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0.0009	0.0009	0	0.0009	<0.005	0
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS								
Sum of PFHxS and PFOS	mg/kg	0.0002	0.0009	0.0009	0	0.0009	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002	0.0009	0.0009	0	0.0009	<0.01	0
Sum of PFAS	mg/kg	0.0002	0.0009	0.0009	0	0.0009	<0.05	0

APPENDIX

C

LABORATORY CERTIFICATES

Cardno

now

Stantec

ALSCompass SAMPLING *Intelligence*

ALS

ALS Use Only

Custody Document for Submissions via ALS Compass App

Project: WA_0069_PFASOMP **Client:** Department of Defence **Project Manager:** [redacted]

ALS Compass COC Reference: **# Samples:** **Phone:** ( )

COC NO: 38219; 46231; 46230; 46229; 38223; 38222; 46243; 46245; 46240 **Sampler:** [redacted]

Turnaround Requirements: Standard ✓ Urgent **Phone:** ( )

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/12/22 ~ 4:00pm	Date / Time: 13/12 1230	Date / Time:	Date / Time:

Environmental Division Perth

Work Order Reference EP2216873

Telephone : -- 61-8-9406 1301

CHAIN OF CUSTODY

(ALS) COC#: 38222 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW356		12/12/2022 09:54 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
002	0089_PW331		12/12/2022 10:03 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
003	0089_SW150		12/12/2022 10:09 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
004	0089_PW357		12/12/2022 10:27 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
005	0089_SW152		12/12/2022 10:34 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
006	0089_PW330		12/12/2022 10:57 AM	WATER	ALS: 5 Non ALS: 0	No		Partial 4/8		extra PFAS bottles for lab QC
007	0089_QC105		12/12/2022 10:58 AM	WATER	ALS: 2 Non ALS: 0	No	X			
008	0089_SW154		12/12/2022 11:12 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
009	0089_QC109		12/12/2022 11:13 AM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: 38222 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_PW358		12/12/2022 11:38 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
011	0089_PW329		12/12/2022 11:48 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
012	0089_SW156		12/12/2022 11:55 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
013	0089_PW351		12/12/2022 03:56 PM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
014	0089_SW382		12/12/2022 03:58 PM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
015	0089_SW383		12/12/2022 03:59 PM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
016	0089_SW384		12/12/2022 04:00 PM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 38222 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW356	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW331	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_SW150	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_PW357	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_SW152	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW330	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_SW154	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
010	0089_PW358	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_PW329	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 38222 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

012	0089_SW156	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_PW351	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_SW382	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0089_SW383	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
016	0089_SW384	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 38222 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW356	Clear Plastic Bottle - Natural	500 mL	00070522143307	Green	No	
001	0089_PW356	HDPE (no PTFE)	20 mL	00350522043027	Grey	No	
001	0089_PW356	HDPE (no PTFE)	20 mL	00350522042958	Grey	No	
002	0089_PW331	Clear Plastic Bottle - Natural	500 mL	00070522143340	Green	No	
002	0089_PW331	HDPE (no PTFE)	20 mL	00350522062432	Grey	No	
002	0089_PW331	HDPE (no PTFE)	20 mL	00350522043044	Grey	No	
003	0089_SW150	Clear Plastic Bottle - Natural	500 mL	00070522143165	Green	No	
003	0089_SW150	HDPE (no PTFE)	20 mL	00350522042886	Grey	No	
003	0089_SW150	HDPE (no PTFE)	20 mL	00350522043103	Grey	No	
004	0089_PW357	Clear Plastic Bottle - Natural	500 mL	00070522143074	Green	No	
004	0089_PW357	HDPE (no PTFE)	20 mL	00350522043022	Grey	No	
004	0089_PW357	HDPE (no PTFE)	20 mL	00350522042829	Grey	No	
005	0089_SW152	HDPE (no PTFE)	20 mL	00350522042716	Grey	No	
005	0089_SW152	Clear Plastic Bottle - Natural	500 mL	00070522143381	Green	No	
005	0089_SW152	HDPE (no PTFE)	20 mL	00350522042811	Grey	No	
006	0089_PW330	Clear Plastic Bottle - Natural	500 mL	00070522143206	Green	No	
006	0089_PW330	HDPE (no PTFE)	20 mL	00350821000358	Grey	No	
006	0089_PW330	HDPE (no PTFE)	20 mL	00350522043111	Grey	No	
006	0089_PW330	HDPE (no PTFE)	20 mL	00350522043196	Grey	No	
006	0089_PW330	HDPE (no PTFE)	20 mL	00350821000263	Grey	No	
007	0089_QC105	HDPE (no PTFE)	20 mL	00350019041296	Grey	No	
007	0089_QC105	HDPE (no PTFE)	20 mL	00350019041115	Grey	No	
008	0089_SW154	Clear Plastic Bottle - Natural	500 mL	00070522143274	Green	No	
008	0089_SW154	HDPE (no PTFE)	20 mL	00350019014960	Grey	No	
008	0089_SW154	HDPE (no PTFE)	20 mL	00350019015348	Grey	No	
009	0089_QC109	HDPE (no PTFE)	20 mL	00350019041096	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 38222 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_QC109	HDPE (no PTFE)	20 mL	00350019041170	Grey	No	
010	0089_PW358	Clear Plastic Bottle - Natural	500 mL	00070522143311	Green	No	
010	0089_PW358	HDPE (no PTFE)	20 mL	00350522043131	Grey	No	
010	0089_PW358	HDPE (no PTFE)	20 mL	00350522042993	Grey	No	
011	0089_PW329	Clear Plastic Bottle - Natural	500 mL	00070522143258	Green	No	
011	0089_PW329	HDPE (no PTFE)	20 mL	00350522062424	Grey	No	
011	0089_PW329	HDPE (no PTFE)	20 mL	00350522043068	Grey	No	
012	0089_SW156	Clear Plastic Bottle - Natural	500 mL	00070522143237	Green	No	
012	0089_SW156	HDPE (no PTFE)	20 mL	00350522042747	Grey	No	
012	0089_SW156	HDPE (no PTFE)	20 mL	00350522043093	Grey	No	
013	0089_PW351	Clear Plastic Bottle - Natural	500 mL	00070522146741	Green	No	
013	0089_PW351	HDPE (no PTFE)	20 mL	00350522062401	Grey	No	
013	0089_PW351	HDPE (no PTFE)	20 mL	00350522043046	Grey	No	
014	0089_SW382	HDPE (no PTFE)	20 mL	00350522042803	Grey	No	
014	0089_SW382	HDPE (no PTFE)	20 mL	00350522042818	Grey	No	
014	0089_SW382	Clear Plastic Bottle - Natural	500 mL	00070522146723	Green	No	
015	0089_SW383	HDPE (no PTFE)	20 mL	00350522042932	Grey	No	
015	0089_SW383	HDPE (no PTFE)	20 mL	00350522062427	Grey	No	
015	0089_SW383	Clear Plastic Bottle - Natural	500 mL	00070522163815	Green	No	
016	0089_SW384	HDPE (no PTFE)	20 mL	00350522043005	Grey	No	
016	0089_SW384	HDPE (no PTFE)	20 mL	00350522043063	Grey	No	
016	0089_SW384	Clear Plastic Bottle - Natural	500 mL	00070522163736	Green	No	

Total Bottle Count: ALS: 48, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216873**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38222	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 12:30	Issue Date	: 16-Dec-2022
Client Requested Due Date	: 29-Dec-2022	Scheduled Reporting Date	: **29-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 16 / 16

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2216873-001	12-Dec-2022 09:54	0089_PW356_221212	✓	✓	✓	✓
EP2216873-002	12-Dec-2022 10:03	0089_PW331_221212	✓	✓	✓	✓
EP2216873-003	12-Dec-2022 10:09	0089_SW150_221212	✓	✓	✓	✓
EP2216873-004	12-Dec-2022 10:27	0089_PW357_221212	✓	✓	✓	✓
EP2216873-005	12-Dec-2022 10:34	0089_SW152_221212	✓	✓	✓	✓
EP2216873-006	12-Dec-2022 10:57	0089_PW330_221212	✓	✓	✓	✓
EP2216873-007	12-Dec-2022 10:58	0089_QC105_221212		✓		
EP2216873-008	12-Dec-2022 11:12	0089_SW154_221212	✓	✓	✓	✓
EP2216873-009	12-Dec-2022 11:13	0089_QC109_221212		✓		
EP2216873-010	12-Dec-2022 11:38	0089_PW358_221212	✓	✓	✓	✓
EP2216873-011	12-Dec-2022 11:48	0089_PW329_221212	✓	✓	✓	✓
EP2216873-012	12-Dec-2022 11:55	0089_SW156_221212	✓	✓	✓	✓
EP2216873-013	12-Dec-2022 15:56	0089_PW351_221212	✓	✓	✓	✓
EP2216873-014	12-Dec-2022 15:58	0089_SW382_221212	✓	✓	✓	✓
EP2216873-015	12-Dec-2022 15:59	0089_SW383_221212	✓	✓	✓	✓
EP2216873-016	12-Dec-2022 16:00	0089_SW384_221212	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216873**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2022
C-O-C number	: 38222	Issue Date	: 29-Dec-2022 18:33
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: MARINE WATER (Matrix: WATER)				Sample ID	0089_PW329_221212	0089_SW156_221212	0089_PW351_221212	0089_SW383_221212	----
				Sampling date / time	12-Dec-2022 11:48	12-Dec-2022 11:55	12-Dec-2022 15:56	12-Dec-2022 15:59	----
Compound	CAS Number	LOR	Unit		EP2216873-011	EP2216873-012	EP2216873-013	EP2216873-015	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		180	131	136	125	----
Total Alkalinity as CaCO3	----	1	mg/L		180	131	136	125	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2930	2900	2900	2830	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		26100	20900	22500	22100	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		480	452	466	458	----
Magnesium	7439-95-4	1	mg/L		1480	1390	1460	1470	----
Sodium	7440-23-5	1	mg/L		11900	11200	11700	11800	----
Potassium	7440-09-7	1	mg/L		602	557	588	586	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		801	652	698	685	----
ø Total Cations	----	0.01	meq/L		679	638	667	672	----
ø Ionic Balance	----	0.01	%		8.25	1.10	2.23	0.94	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: MARINE WATER (Matrix: WATER)				Sample ID	0089_PW329_221212	0089_SW156_221212	0089_PW351_221212	0089_SW383_221212	----
				Sampling date / time	12-Dec-2022 11:48	12-Dec-2022 11:55	12-Dec-2022 15:56	12-Dec-2022 15:59	----
Compound	CAS Number	LOR	Unit		EP2216873-011	EP2216873-012	EP2216873-013	EP2216873-015	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: MARINE WATER (Matrix: WATER)				Sample ID	0089_PW329_221212	0089_SW156_221212	0089_PW351_221212	0089_SW383_221212	----
				Sampling date / time	12-Dec-2022 11:48	12-Dec-2022 11:55	12-Dec-2022 15:56	12-Dec-2022 15:59	----
Compound	CAS Number	LOR	Unit		EP2216873-011	EP2216873-012	EP2216873-013	EP2216873-015	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.8**	**89.3**	**91.5**	**99.6**	----
13C8-PFOA	----	0.02	%		**98.1**	**101**	**98.6**	**101**	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW356_221212	0089_PW331_221212	0089_SW150_221212	0089_PW357_221212	0089_SW152_221212
			Sampling date / time	12-Dec-2022 09:54	12-Dec-2022 10:03	12-Dec-2022 10:09	12-Dec-2022 10:27	12-Dec-2022 10:34
Compound	CAS Number	LOR	Unit	EP2216873-001	EP2216873-002	EP2216873-003	EP2216873-004	EP2216873-005
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**178**	**214**	**133**	**171**	**139**
Total Alkalinity as CaCO3	----	1	mg/L	**178**	**214**	**133**	**171**	**139**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2950**	**2880**	**2650**	**2810**	**2810**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**21700**	**21000**	**19000**	**19300**	**21100**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**508**	**471**	**453**	**463**	**466**
Magnesium	7439-95-4	1	mg/L	**1570**	**1460**	**1400**	**1440**	**1450**
Sodium	7440-23-5	1	mg/L	**12600**	**11900**	**11600**	**11900**	**11800**
Potassium	7440-09-7	1	mg/L	**634**	**587**	**561**	**574**	**584**
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**677**	**657**	**594**	**606**	**656**
ø Total Cations	----	0.01	meq/L	**719**	**676**	**657**	**674**	**671**
ø Ionic Balance	----	0.01	%	**2.99**	**1.48**	**5.03**	**5.28**	**1.08**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	**0.02**	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW356_221212	0089_PW331_221212	0089_SW150_221212	0089_PW357_221212	0089_SW152_221212
			Sampling date / time	12-Dec-2022 09:54	12-Dec-2022 10:03	12-Dec-2022 10:09	12-Dec-2022 10:27	12-Dec-2022 10:34
Compound	CAS Number	LOR	Unit	EP2216873-001	EP2216873-002	EP2216873-003	EP2216873-004	EP2216873-005
				Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_221212	0089_PW331_221212	0089_SW150_221212	0089_PW357_221212	0089_SW152_221212
				Sampling date / time	12-Dec-2022 09:54	12-Dec-2022 10:03	12-Dec-2022 10:09	12-Dec-2022 10:27	12-Dec-2022 10:34
Compound	CAS Number	LOR	Unit		EP2216873-001	EP2216873-002	EP2216873-003	EP2216873-004	EP2216873-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.8**	**98.0**	**99.8**	**92.8**	**94.9**
13C8-PFOA	----	0.02	%		**103**	**104**	**97.7**	**99.8**	**99.1**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW330_221212	0089_QC105_221212	0089_SW154_221212	0089_QC109_221212	0089_PW358_221212
			Sampling date / time	12-Dec-2022 10:57	12-Dec-2022 10:58	12-Dec-2022 11:12	12-Dec-2022 11:13	12-Dec-2022 11:38
Compound	CAS Number	LOR	Unit	EP2216873-006	EP2216873-007	EP2216873-008	EP2216873-009	EP2216873-010
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	<1	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**192**	----	**133**	----	**273**
Total Alkalinity as CaCO3	----	1	mg/L	**192**	----	**133**	----	**273**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2910**	----	**2780**	----	**2970**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**22000**	----	**22100**	----	**22100**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**464**	----	**450**	----	**492**
Magnesium	7439-95-4	1	mg/L	**1410**	----	**1410**	----	**1450**
Sodium	7440-23-5	1	mg/L	**11400**	----	**11600**	----	**11800**
Potassium	7440-09-7	1	mg/L	**566**	----	**566**	----	**589**
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**685**	----	**684**	----	**691**
ø Total Cations	----	0.01	meq/L	**650**	----	**658**	----	**672**
ø Ionic Balance	----	0.01	%	**2.66**	----	**1.97**	----	**1.36**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW330_221212	0089_QC105_221212	0089_SW154_221212	0089_QC109_221212	0089_PW358_221212
				Sampling date / time	12-Dec-2022 10:57	12-Dec-2022 10:58	12-Dec-2022 11:12	12-Dec-2022 11:13	12-Dec-2022 11:38
Compound	CAS Number	LOR	Unit		EP2216873-006	EP2216873-007	EP2216873-008	EP2216873-009	EP2216873-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW330_221212	0089_QC105_221212	0089_SW154_221212	0089_QC109_221212	0089_PW358_221212
			Sampling date / time	12-Dec-2022 10:57	12-Dec-2022 10:58	12-Dec-2022 11:12	12-Dec-2022 11:13	12-Dec-2022 11:38
Compound	CAS Number	LOR	Unit	EP2216873-006	EP2216873-007	EP2216873-008	EP2216873-009	EP2216873-010
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**97.5**	**98.1**	**94.8**	**99.1**	**98.9**
13C8-PFOA	----	0.02	%	**99.5**	**99.9**	**97.2**	**99.4**	**100**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW382_221212	0089_SW384_221212	----	----	----
				Sampling date / time	12-Dec-2022 15:58	12-Dec-2022 16:00	----	----	----
Compound	CAS Number	LOR	Unit		EP2216873-014	EP2216873-016	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		**5**	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**118**	**125**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**123**	**125**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2800**	**2820**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**21500**	**21500**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**474**	**443**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1490**	**1390**	----	----	----
Sodium	7440-23-5	1	mg/L		**12100**	**11200**	----	----	----
Potassium	7440-09-7	1	mg/L		**596**	**557**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**667**	**668**	----	----	----
ø Total Cations	----	0.01	meq/L		**688**	**638**	----	----	----
ø Ionic Balance	----	0.01	%		**1.52**	**2.28**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_SW382_221212	0089_SW384_221212	----	----	----
			Sampling date / time	12-Dec-2022 15:58	12-Dec-2022 16:00	----	----	----
Compound	CAS Number	LOR	Unit	EP2216873-014	EP2216873-016	--------	--------	--------
				Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW382_221212	0089_SW384_221212	----	----	----
				Sampling date / time	12-Dec-2022 15:58	12-Dec-2022 16:00	----	----	----
Compound	CAS Number	LOR	Unit		EP2216873-014	EP2216873-016	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**97.0**	----	----	----
13C8-PFOA	----	0.02	%		**99.1**	**96.9**	----	----	----

Surrogate Control Limits

Sub-Matrix: **MARINE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216873**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2022
C-O-C number	: 38222	Issue Date	: 29-Dec-2022
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4781468)									
EP2216873-001	0089_PW356_221212	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	178	183	3.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	178	183	3.0	0% - 20%
EP2216873-013	0089_PW351_221212	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	136	138	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	136	138	1.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791350)									
EP2216873-001	0089_PW356_221212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2950	2850	3.5	0% - 20%
EP2216873-013	0089_PW351_221212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2900	2850	1.5	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791349)									
EP2216873-001	0089_PW356_221212	ED045G: Chloride	16887-00-6	1	mg/L	21700	22000	1.4	0% - 20%
EP2216873-013	0089_PW351_221212	ED045G: Chloride	16887-00-6	1	mg/L	22500	21200	6.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4775585)									
EP2216873-001	0089_PW356_221212	ED093F: Calcium	7440-70-2	1	mg/L	508	503	1.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1570	1540	2.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12600	12500	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	634	628	1.0	0% - 20%
EP2216873-013	0089_PW351_221212	ED093F: Calcium	7440-70-2	1	mg/L	466	469	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1460	0.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	11800	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	588	591	0.6	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4786767)									
EP2216873-006	0089_PW330_221212	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4786767)									
EP2216873-006	0089_PW330_221212	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4786767)									
EP2216873-006	0089_PW330_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4786767)									
EP2216873-006	0089_PW330_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4786767) - continued									
EP2216873-006	0089_PW330_221212	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4786767)									
EP2216873-006	0089_PW330_221212	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4781468)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	100	87.8	118
				<1	200 mg/L	98.1	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791350)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	89.9	112
				<1	500 mg/L	112	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791349)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	88.6	113
				<1	1000 mg/L	111	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4775585)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4786767)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	73.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	88.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	80.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	88.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	75.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	86.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786767)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	74.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	86.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	87.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	83.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	85.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786767) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	92.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786767)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	80.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	77.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	67.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	85.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	90.1	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	90.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	70.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786767)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	81.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	75.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	82.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	78.0	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791350)							
EP2216873-001	0089_PW356_221212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791349)							
EP2216873-001	0089_PW356_221212	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216873**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling SW/PW - MB	Issue Date	: 29-Dec-2022
Sampler	: [redacted]	No. of samples received	: 16
Order number	: pfas-omp/Stirling	No. of samples analysed	: 16

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216873--001	0089_PW356_221212	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216873--001	0089_PW356_221212	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_PW356_221212,	0089_PW331_221212,	----	----	----	20-Dec-2022	19-Dec-2022	**1**
0089_SW150_221212,	0089_PW357_221212,						
0089_SW152_221212,	0089_PW330_221212,						
0089_SW154_221212,	0089_PW358_221212,						
0089_PW329_221212,	0089_SW156_221212,						
0089_PW351_221212,	0089_SW382_221212,						
0089_SW383_221212,	0089_SW384_221212						

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	20	5.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	20	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW356_221212, 0089_PW331_221212, 0089_SW150_221212, 0089_PW357_221212, 0089_SW152_221212, 0089_PW330_221212, 0089_SW154_221212, 0089_PW358_221212, 0089_PW329_221212, 0089_SW156_221212, 0089_PW351_221212, 0089_SW382_221212, 0089_SW383_221212, 0089_SW384_221212	**12-Dec-2022**	**----**	----	----	**20-Dec-2022**	26-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW356_221212, 0089_PW331_221212, 0089_SW150_221212, 0089_PW357_221212, 0089_SW152_221212, 0089_PW330_221212, 0089_SW154_221212, 0089_PW358_221212, 0089_PW329_221212, 0089_SW156_221212, 0089_PW351_221212, 0089_SW382_221212, 0089_SW383_221212, 0089_SW384_221212	**12-Dec-2022**	**----**	----	----	**28-Dec-2022**	09-Jan-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW356_221212, 0089_PW331_221212, 0089_SW150_221212, 0089_PW357_221212, 0089_SW152_221212, 0089_PW330_221212, 0089_SW154_221212, 0089_PW358_221212, 0089_PW329_221212, 0089_SW156_221212, 0089_PW351_221212, 0089_SW382_221212, 0089_SW383_221212, 0089_SW384_221212	**12-Dec-2022**	**----**	----	----	**28-Dec-2022**	09-Jan-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW356_221212, 0089_PW331_221212, 0089_SW150_221212, 0089_PW357_221212, 0089_SW152_221212, 0089_PW330_221212, 0089_SW154_221212, 0089_PW358_221212, 0089_PW329_221212, 0089_SW156_221212, 0089_PW351_221212, 0089_SW382_221212, 0089_SW383_221212, 0089_SW384_221212	**12-Dec-2022**	**----**	----	----	**20-Dec-2022**	19-Dec-2022	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW356_221212, 0089_PW331_221212, 0089_SW150_221212, 0089_PW357_221212, 0089_SW152_221212, 0089_PW330_221212, 0089_QC105_221212, 0089_SW154_221212, 0089_QC109_221212, 0089_PW358_221212, 0089_PW329_221212, 0089_SW156_221212, 0089_PW351_221212, 0089_SW382_221212, 0089_SW383_221212, 0089_SW384_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW356_221212, 0089_PW331_221212, 0089_SW150_221212, 0089_PW357_221212, 0089_SW152_221212, 0089_PW330_221212, 0089_QC105_221212, 0089_SW154_221212, 0089_QC109_221212, 0089_PW358_221212, 0089_PW329_221212, 0089_SW156_221212, 0089_PW351_221212, 0089_SW382_221212, 0089_SW383_221212, 0089_SW384_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW356_221212, 0089_PW331_221212, 0089_SW150_221212, 0089_PW357_221212, 0089_SW152_221212, 0089_PW330_221212, 0089_QC105_221212, 0089_SW154_221212, 0089_QC109_221212, 0089_PW358_221212, 0089_PW329_221212, 0089_SW156_221212, 0089_PW351_221212, 0089_SW382_221212, 0089_SW383_221212, 0089_SW384_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW356_221212, 0089_PW331_221212, 0089_SW150_221212, 0089_PW357_221212, 0089_SW152_221212, 0089_PW330_221212, 0089_QC105_221212, 0089_SW154_221212, 0089_QC109_221212, 0089_PW358_221212, 0089_PW329_221212, 0089_SW156_221212, 0089_PW351_221212, 0089_SW382_221212, 0089_SW383_221212, 0089_SW384_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW356_221212, 0089_PW331_221212, 0089_SW150_221212, 0089_PW357_221212, 0089_SW152_221212, 0089_PW330_221212, 0089_QC105_221212, 0089_SW154_221212, 0089_QC109_221212, 0089_PW358_221212, 0089_PW329_221212, 0089_SW156_221212, 0089_PW351_221212, 0089_SW382_221212, 0089_SW383_221212, 0089_SW384_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	20	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2216874

Telephone : – 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0059_PFASOMP **Client:** Department of Defence **Project Manager:** [redacted]

ALS Compass COC Reference: **# Samples:** **Phone:** [redacted]

COC NO: 38219; 46231; 46230; 46229; 38223; 38222; 46243; 46245; 46240

Sampler:

Turnaround Requirements: Standard ✓ Urgent **Phone:** [redacted]

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/12/22 ~ 4:00pm	Date / Time: 13/12 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 38223 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD356		12/12/2022 09:55 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD331		12/12/2022 10:02 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD357		12/12/2022 10:27 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD330		12/12/2022 10:58 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_QC106		12/12/2022 10:59 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD358		12/12/2022 11:39 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD329		12/12/2022 11:47 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
008	0089_SD351		12/12/2022 04:01 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
009	0089_SD352		12/12/2022 04:01 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 38223 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD356	HDPE Soil Jar	200 mL	00620322095497	Grey	No	
002	0089_SD331	HDPE Soil Jar	200 mL	00620322095523	Grey	No	
003	0089_SD357	HDPE Soil Jar	200 mL	00620322095483	Grey	No	
004	0089_SD330	HDPE Soil Jar	200 mL	00620322054427	Grey	No	
005	0089_QC106	HDPE Soil Jar	200 mL	00620322095485	Grey	No	
006	0089_SD358	HDPE Soil Jar	200 mL	00620322095510	Grey	No	
007	0089_SD329	HDPE Soil Jar	200 mL	00620322054430	Grey	No	
008	0089_SD351	HDPE Soil Jar	200 mL	00620322095486	Grey	No	
009	0089_SD352	HDPE Soil Jar	200 mL	00620322095613	Grey	No	

Total Bottle Count: ALS: 9, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216874**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38223	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 12:30	Issue Date	: 16-Dec-2022
Client Requested Due Date	: 29-Dec-2022	Scheduled Reporting Date	: **29-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2216874-001	12-Dec-2022 09:55	0089_SD356_221212	✓	✓
EP2216874-002	12-Dec-2022 10:02	0089_SD331_221212	✓	✓
EP2216874-003	12-Dec-2022 10:27	0089_SD357_221212	✓	✓
EP2216874-004	12-Dec-2022 10:58	0089_SD330_221212	✓	✓
EP2216874-005	12-Dec-2022 10:59	0089_QC106_221212	✓	✓
EP2216874-006	12-Dec-2022 11:39	0089_SD358_221212	✓	✓
EP2216874-007	12-Dec-2022 11:47	0089_SD329_221212	✓	✓
EP2216874-008	12-Dec-2022 16:01	0089_SD351_221212	✓	✓
EP2216874-009	12-Dec-2022 16:01	0089_SD352_221212	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216874**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 22-Dec-2022
C-O-C number	: 38223	Issue Date	: 29-Dec-2022 12:27
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD356_221212	0089_SD331_221212	0089_SD357_221212	0089_SD330_221212	0089_QC106_221212
				Sampling date / time	12-Dec-2022 09:55	12-Dec-2022 10:02	12-Dec-2022 10:27	12-Dec-2022 10:58	12-Dec-2022 10:59
					EP2216874-001	EP2216874-002	EP2216874-003	EP2216874-004	EP2216874-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**30.1**	**23.7**	**29.9**	**29.6**	**31.0**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD356_221212	0089_SD331_221212	0089_SD357_221212	0089_SD330_221212	0089_QC106_221212
				Sampling date / time	12-Dec-2022 09:55	12-Dec-2022 10:02	12-Dec-2022 10:27	12-Dec-2022 10:58	12-Dec-2022 10:59
Compound	CAS Number	LOR	Unit		EP2216874-001	EP2216874-002	EP2216874-003	EP2216874-004	EP2216874-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**89.0**	**91.0**	**92.0**	**78.5**	**90.0**
13C8-PFOA	----	0.0002	%		**85.5**	**84.5**	**88.0**	**88.0**	**82.5**

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD358_221212	0089_SD329_221212	0089_SD351_221212	0089_SD352_221212	----
				Sampling date / time	12-Dec-2022 11:39	12-Dec-2022 11:47	12-Dec-2022 16:01	12-Dec-2022 16:01	----
					EP2216874-006	EP2216874-007	EP2216874-008	EP2216874-009	--------
					Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**26.0**	**30.8**	**28.4**	**18.5**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**----**
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD358_221212	0089_SD329_221212	0089_SD351_221212	0089_SD352_221212	----
				Sampling date / time	12-Dec-2022 11:39	12-Dec-2022 11:47	12-Dec-2022 16:01	12-Dec-2022 16:01	----
Compound	CAS Number	LOR	Unit		EP2216874-006	EP2216874-007	EP2216874-008	EP2216874-009	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**92.0**	**91.0**	**90.0**	**86.5**	----
13C8-PFOA	----	0.0002	%		**91.0**	**92.5**	**84.5**	**87.0**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216874**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 22-Dec-2022
C-O-C number	: 38223	Issue Date	: 29-Dec-2022
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4788453)									
EP2216874-003	0089_SD357_221212	EA055: Moisture Content	----	0.1	%	29.9	29.2	2.3	0% - 20%
EP2217117-004	Anonymous	EA055: Moisture Content	----	0.1	%	0.6	0.2	102	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4788457)									
EP2216874-008	0089_SD351_221212	EA055: Moisture Content	----	0.1	%	28.4	27.2	4.5	0% - 20%
EP2216880-011	Anonymous	EA055: Moisture Content	----	0.1	%	35.2	35.9	1.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4786199)									
EP2216874-001	0089_SD356_221212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2216875-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4786199)									
EP2216874-001	0089_SD356_221212	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4786199) - continued									
EP2216874-001	0089_SD356_221212	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2216875-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4786199)									
EP2216874-001	0089_SD356_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2216875-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4786199) - continued									
EP2216875-002	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4786199)									
EP2216874-001	0089_SD356_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2216875-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4786199)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786199)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	103	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786199)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.9	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	115	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786199)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	76.0	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	81.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	92.4	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786199) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	80.8	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4786199)							
EP2216874-001	0089_SD356_221212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	80.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	100	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	106	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	120	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	79.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	117	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786199)							
EP2216874-001	0089_SD356_221212	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	112	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	118	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	117	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	107	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	85.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	96.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	81.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	89.6	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	120	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	84.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	97.8	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786199)							
EP2216874-001	0089_SD356_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	119	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	114	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	109	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	108	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	105	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	114	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786199) - continued							
EP2216874-001	0089_SD356_221212	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	116	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786199)							
EP2216874-001	0089_SD356_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	85.6	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	94.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	92.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	130	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216874**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling SD - MB	Issue Date	: 29-Dec-2022
Sampler	: [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD356_221212, 0089_SD331_221212, 0089_SD357_221212, 0089_SD330_221212, 0089_QC106_221212, 0089_SD358_221212, 0089_SD329_221212, 0089_SD351_221212, 0089_SD352_221212	**12-Dec-2022**	**----**	----	----	**22-Dec-2022**	26-Dec-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_221212, 0089_SD331_221212, 0089_SD357_221212, 0089_SD330_221212, 0089_QC106_221212, 0089_SD358_221212, 0089_SD329_221212, 0089_SD351_221212, 0089_SD352_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**23-Dec-2022**	31-Jan-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_221212, 0089_SD331_221212, 0089_SD357_221212, 0089_SD330_221212, 0089_QC106_221212, 0089_SD358_221212, 0089_SD329_221212, 0089_SD351_221212, 0089_SD352_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**23-Dec-2022**	31-Jan-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD356_221212, 0089_SD331_221212, 0089_SD357_221212, 0089_SD330_221212, 0089_QC106_221212, 0089_SD358_221212, 0089_SD329_221212, 0089_SD351_221212, 0089_SD352_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**23-Dec-2022**	31-Jan-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_221212, 0089_SD331_221212, 0089_SD357_221212, 0089_SD330_221212, 0089_QC106_221212, 0089_SD358_221212, 0089_SD329_221212, 0089_SD351_221212, 0089_SD352_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**23-Dec-2022**	31-Jan-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD356_221212, 0089_SD331_221212, 0089_SD357_221212, 0089_SD330_221212, 0089_QC106_221212, 0089_SD358_221212, 0089_SD329_221212, 0089_SD351_221212, 0089_SD352_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**23-Dec-2022**	31-Jan-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
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ALS

Environmental Division
Perth
Work Order Reference
EP2216875

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0069_PFASOMP **Client:** Department of Defence **Project Manager:** [redacted]

ALS Compass COC Reference: **# Samples:** **Phone:** [redacted]

COC NO: 38219; 46231; 46230; 46229; 38223; 38222; 46243; 46245; 46240 **Sampler:**

Turnaround Requirements: Standard ✓ Urgent **Phone:** ( )

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/12/22 ~ 4:00pm	Date / Time: 13/12 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: **46229** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD380		12/12/2022 12:58 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD350		12/12/2022 12:58 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD401		12/12/2022 12:59 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD381		12/12/2022 04:01 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 46229 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD380	HDPE Soil Jar	200 mL	00620322095481	Grey	No	
002	0089_SD350	HDPE Soil Jar	200 mL	00620322095492	Grey	No	
003	0089_SD401	HDPE Soil Jar	200 mL	00620322095596	Grey	No	
004	0089_SD381	HDPE Soil Jar	200 mL	00620322095474	Grey	No	

Total Bottle Count: ALS: 4, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216875**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46229	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 12:30	Issue Date	: 16-Dec-2022
Client Requested Due Date	: 29-Dec-2022	Scheduled Reporting Date	: **29-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2216875-001	12-Dec-2022 12:58	0089_SD380_221212	✓	✓
EP2216875-002	12-Dec-2022 12:58	0089_SD350_221212	✓	✓
EP2216875-003	12-Dec-2022 12:59	0089_SD401_221212	✓	✓
EP2216875-004	12-Dec-2022 16:01	0089_SD381_221212	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216875**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 22-Dec-2022
C-O-C number	: 46229	Issue Date	: 29-Dec-2022 12:27
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD380_221212	0089_SD350_221212	0089_SD401_221212	0089_SD381_221212	----
			Sampling date / time	12-Dec-2022 12:58	12-Dec-2022 12:58	12-Dec-2022 12:59	12-Dec-2022 16:01	----
Compound	CAS Number	LOR	Unit	EP2216875-001	EP2216875-002	EP2216875-003	EP2216875-004	--------
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**19.7**	**32.7**	**27.5**	**23.1**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0002**	**0.0002**	**0.0015**	<0.0002	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD380_221212	0089_SD350_221212	0089_SD401_221212	0089_SD381_221212	----
				Sampling date / time	12-Dec-2022 12:58	12-Dec-2022 12:58	12-Dec-2022 12:59	12-Dec-2022 16:01	----
Compound	CAS Number	LOR	Unit		EP2216875-001	EP2216875-002	EP2216875-003	EP2216875-004	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0002**	**0.0002**	**0.0015**	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0002**	**0.0002**	**0.0015**	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0002**	**0.0002**	**0.0015**	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**93.0**	**89.5**	**94.0**	**88.5**	----
13C8-PFOA	----	0.0002	%		**90.0**	**98.5**	**94.0**	**96.0**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216875**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 22-Dec-2022
C-O-C number	: 46229	Issue Date	: 29-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4788457)									
EP2216874-008	Anonymous	EA055: Moisture Content	----	0.1	%	28.4	27.2	4.5	0% - 20%
EP2216880-011	Anonymous	EA055: Moisture Content	----	0.1	%	35.2	35.9	1.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4786199)									
EP2216874-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2216875-002	0089_SD350_221212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4786199)									
EP2216874-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4786199) - continued									
EP2216874-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2216875-002	0089_SD350_221212	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4786199)									
EP2216874-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2216875-002	0089_SD350_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4786199)									
EP2216874-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2216875-002	0089_SD350_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4786199)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786199)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	103	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786199)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.9	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	115	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786199)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	76.0	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	81.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	92.4	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786199) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	80.8	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4786199)							
EP2216874-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	80.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	100	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	106	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	120	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	79.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	117	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786199)							
EP2216874-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	112	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	118	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	117	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	107	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	85.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	96.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	81.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	89.6	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	120	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	84.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	97.8	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786199)							
EP2216874-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	119	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	114	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	109	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	108	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	105	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	114	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786199) - continued							
EP2216874-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	116	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786199)							
EP2216874-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	85.6	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	94.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	92.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	130	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216875**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling SD - CG	Issue Date	: 29-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 4
Order number	: pfas-omp/Stirling	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD380_221212, 0089_SD350_221212, 0089_SD401_221212, 0089_SD381_221212	**12-Dec-2022**	**----**	----	----	**22-Dec-2022**	26-Dec-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD380_221212, 0089_SD350_221212, 0089_SD401_221212, 0089_SD381_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**23-Dec-2022**	31-Jan-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD380_221212, 0089_SD350_221212, 0089_SD401_221212, 0089_SD381_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**23-Dec-2022**	31-Jan-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD380_221212, 0089_SD350_221212, 0089_SD401_221212, 0089_SD381_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**23-Dec-2022**	31-Jan-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD380_221212, 0089_SD350_221212, 0089_SD401_221212, 0089_SD381_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**23-Dec-2022**	31-Jan-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD380_221212, 0089_SD350_221212, 0089_SD401_221212, 0089_SD381_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**23-Dec-2022**	31-Jan-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2216876

Telephone : 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0069_PFASOMP **Client:** Department of Defence **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: **# Samples:**

COC NO: 38219; 46231; 46230; 46229; 38223; 38222; 46243; 46245; 46240

Sampler:

Phone:

Turnaround Requirements: Standard ✓ Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/12/22 ~ 4:00pm	Date / Time: 13/12 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 46230 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW171		12/12/2022 11:23 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_MW172		12/12/2022 09:24 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_MW166		12/12/2022 09:51 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_MW161		12/12/2022 10:26 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_MW199		12/12/2022 11:06 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_QC108		12/12/2022 11:06 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_MW195D		12/12/2022 11:21 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_MW195S		12/12/2022 11:24 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_MW193		12/12/2022 11:24 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: 46230 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_QC111		12/12/2022 11:30 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
011	0089_MW173		12/12/2022 12:20 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
012	0089_MW197		12/12/2022 12:48 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
013	0089_QC115		12/12/2022 12:50 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
014	0089_MW200		12/12/2022 01:00 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 46230 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW171	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW172	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW166	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW161	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW199	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_QC108	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW195D	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW195S	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW193	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 46230 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

010	0089_QC111	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_MW173	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_MW197	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_QC115	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_MW200	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 46230 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW171	HDPE (no PTFE)	20 mL	00350522043041	Grey	No	
001	0089_MW171	HDPE (no PTFE)	20 mL	00350522043158	Grey	No	
001	0089_MW171	Clear Plastic Bottle - Natural	500 mL	00070522163809	Green	No	
002	0089_MW172	Clear Plastic Bottle - Natural	500 mL	00070522163782	Green	No	
002	0089_MW172	HDPE (no PTFE)	20 mL	00350522062448	Grey	No	
002	0089_MW172	HDPE (no PTFE)	20 mL	00350522043057	Grey	No	
003	0089_MW166	HDPE (no PTFE)	20 mL	00350522043135	Grey	No	
003	0089_MW166	HDPE (no PTFE)	20 mL	00350522043194	Grey	No	
003	0089_MW166	Clear Plastic Bottle - Natural	500 mL	00070522146746	Green	No	
004	0089_MW161	Clear Plastic Bottle - Natural	500 mL	00070522146760	Green	No	
004	0089_MW161	HDPE (no PTFE)	20 mL	00350522043190	Grey	No	
004	0089_MW161	HDPE (no PTFE)	20 mL	00350522043080	Grey	No	
005	0089_MW199	Clear Plastic Bottle - Natural	500 mL	00070522163671	Green	No	
005	0089_MW199	HDPE (no PTFE)	20 mL	00350522043136	Grey	No	
005	0089_MW199	HDPE (no PTFE)	20 mL	00350522042722	Grey	No	
006	0089_QC108	Clear Plastic Bottle - Natural	500 mL	00070522163777	Green	No	
006	0089_QC108	HDPE (no PTFE)	20 mL	00350522043056	Grey	No	
006	0089_QC108	HDPE (no PTFE)	20 mL	00350522043015	Grey	No	
007	0089_MW195D	HDPE (no PTFE)	20 mL	00350522062461	Grey	No	
007	0089_MW195D	HDPE (no PTFE)	20 mL	00350522062408	Grey	No	
007	0089_MW195D	Clear Plastic Bottle - Natural	500 mL	00070522146758	Green	No	
008	0089_MW195S	HDPE (no PTFE)	20 mL	00350522042781	Grey	No	
008	0089_MW195S	HDPE (no PTFE)	20 mL	00350522062478	Grey	No	
008	0089_MW195S	Clear Plastic Bottle - Natural	500 mL	00070522146750	Green	No	
009	0089_MW193	HDPE (no PTFE)	20 mL	00350522042731	Grey	No	
009	0089_MW193	HDPE (no PTFE)	20 mL	00350522042725	Grey	No	

Monday, December 12, 2022 12:48:42 PM

CHAIN OF CUSTODY

COC#: 46230 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW193	Clear Plastic Bottle - Natural	500 mL	00070522146748	Green	No	
010	0089_QC111	HDPE (no PTFE)	20 mL	00350522042869	Grey	No	
010	0089_QC111	HDPE (no PTFE)	20 mL	00350522042929	Grey	No	
010	0089_QC111	Clear Plastic Bottle - Natural	500 mL	00070522146735	Green	No	
011	0089_MW173	Clear Plastic Bottle - Natural	500 mL	00070522163794	Green	No	
011	0089_MW173	HDPE (no PTFE)	20 mL	00350522042940	Grey	No	
011	0089_MW173	HDPE (no PTFE)	20 mL	00350522042741	Grey	No	
012	0089_MW197	HDPE (no PTFE)	20 mL	00350522062420	Grey	No	
012	0089_MW197	HDPE (no PTFE)	20 mL	00350522062452	Grey	No	
012	0089_MW197	Clear Plastic Bottle - Natural	500 mL	00070522146722	Green	No	
013	0089_QC115	Clear Plastic Bottle - Natural	500 mL	00070522146766	Green	No	
013	0089_QC115	HDPE (no PTFE)	20 mL	00350522043065	Grey	No	
013	0089_QC115	HDPE (no PTFE)	20 mL	00350522062483	Grey	No	
014	0089_MW200	Clear Plastic Bottle - Natural	500 mL	00070522163732	Green	No	
014	0089_MW200	HDPE (no PTFE)	20 mL	00350522042872	Grey	No	
014	0089_MW200	HDPE (no PTFE)	20 mL	00350522043123	Grey	No	

Total Bottle Count: ALS: 42, Non ALS: 0

CHAIN OF CUSTODY

ALS COC#: 46230 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW171		12/12/2022 11:23 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_MW172		12/12/2022 09:24 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_MW166		12/12/2022 09:51 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_MW161		12/12/2022 10:26 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_MW199		12/12/2022 11:06 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_QC108		12/12/2022 11:06 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_MW195D		12/12/2022 11:21 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_MW195S		12/12/2022 11:24 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_MW193		12/12/2022 11:24 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 46230 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_QC111		12/12/2022 11:30 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
011	0089_MW173		12/12/2022 12:20 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
012	0089_MW197		12/12/2022 12:48 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
013	0089_QC115		12/12/2022 12:50 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
014	0089_MW200		12/12/2022 01:00 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 46230 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW171	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW172	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW166	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW161	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW199	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_QC108	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW195D	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW195S	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW193	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 46230 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_QC111	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_MW173	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_MW197	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_QC115	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_MW200	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 46230 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW171	HDPE (no PTFE)	20 mL	00350522043041	Grey	No	
001	0089_MW171	HDPE (no PTFE)	20 mL	00350522043158	Grey	No	
001	0089_MW171	Clear Plastic Bottle - Natural	500 mL	00070522163809	Green	No	
001	0089_MW171	Clear Plastic Bottle - Natural	500 mL	00070522163782	Green	No	
002	0089_MW172	HDPE (no PTFE)	20 mL	00350522062448	Grey	No	
002	0089_MW172	HDPE (no PTFE)	20 mL	00350522043057	Grey	No	
002	0089_MW172	HDPE (no PTFE)	20 mL	00350522043135	Grey	No	
003	0089_MW166	HDPE (no PTFE)	20 mL	00350522043194	Grey	No	
003	0089_MW166	Clear Plastic Bottle - Natural	500 mL	00070522146746	Green	No	
003	0089_MW166	Clear Plastic Bottle - Natural	500 mL	00070522146760	Green	No	
004	0089_MW161	HDPE (no PTFE)	20 mL	00350522043190	Grey	No	
004	0089_MW161	HDPE (no PTFE)	20 mL	00350522043080	Grey	No	
004	0089_MW161	Clear Plastic Bottle - Natural	500 mL	00070522163671	Green	No	
005	0089_MW199	HDPE (no PTFE)	20 mL	00350522043136	Grey	No	
005	0089_MW199	HDPE (no PTFE)	20 mL	00350522042722	Grey	No	
005	0089_MW199	Clear Plastic Bottle - Natural	500 mL	00070522163777	Green	No	
006	0089_QC108	HDPE (no PTFE)	20 mL	00350522043056	Grey	No	
006	0089_QC108	HDPE (no PTFE)	20 mL	00350522043015	Grey	No	
006	0089_QC108	HDPE (no PTFE)	20 mL	00350522062461	Grey	No	
007	0089_MW195D	HDPE (no PTFE)	20 mL	00350522062408	Grey	No	
007	0089_MW195D	Clear Plastic Bottle - Natural	500 mL	00070522146758	Green	No	
007	0089_MW195D	HDPE (no PTFE)	20 mL	00350522042781	Grey	No	
008	0089_MW195S	HDPE (no PTFE)	20 mL	00350522062478	Grey	No	
008	0089_MW195S	Clear Plastic Bottle - Natural	500 mL	00070522146750	Green	No	
008	0089_MW195S	HDPE (no PTFE)	20 mL	00350522042731	Grey	No	
009	0089_MW193	HDPE (no PTFE)	20 mL	00350522042725	Grey	No	
009	0089_MW193						

Monday, December 12, 2022 12:48:42 PM

CHAIN OF CUSTODY

ALS COC#: 46230 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW193	Clear Plastic Bottle - Natural	500 mL	00070522146748	Green	No	
010	0089_QC111	HDPE (no PTFE)	20 mL	00350522042869	Grey	No	
010	0089_QC111	HDPE (no PTFE)	20 mL	00350522042929	Grey	No	
010	0089_QC111	Clear Plastic Bottle - Natural	500 mL	00070522146735	Green	No	
011	0089_MW173	Clear Plastic Bottle - Natural	500 mL	00070522163794	Green	No	
011	0089_MW173	HDPE (no PTFE)	20 mL	00350522042940	Grey	No	
011	0089_MW173	HDPE (no PTFE)	20 mL	00350522042741	Grey	No	
012	0089_MW197	HDPE (no PTFE)	20 mL	00350522062420	Grey	No	
012	0089_MW197	HDPE (no PTFE)	20 mL	00350522062452	Grey	No	
012	0089_MW197	Clear Plastic Bottle - Natural	500 mL	00070522146722	Green	No	
013	0089_QC115	Clear Plastic Bottle - Natural	500 mL	00070522146766	Green	No	
013	0089_QC115	HDPE (no PTFE)	20 mL	00350522043065	Grey	No	
013	0089_QC115	HDPE (no PTFE)	20 mL	00350522062483	Grey	No	
014	0089_MW200	Clear Plastic Bottle - Natural	500 mL	00070522163732	Green	No	
014	0089_MW200	HDPE (no PTFE)	20 mL	00350522042872	Grey	No	
014	0089_MW200	HDPE (no PTFE)	20 mL	00350522043123	Grey	No	

Total Bottle Count: ALS: 42, Non ALS: 0

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216876**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46230	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 12:30	Issue Date	: 19-Dec-2022
Client Requested Due Date	: 30-Dec-2022	Scheduled Reporting Date	: **30-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.0
Receipt Detail	:	No. of samples received / analysed	: 15 / 15

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2216876-001	12-Dec-2022 11:23	0089_MW171_221212	✓	✓	✓	✓
EP2216876-002	12-Dec-2022 09:24	0089_MW172_221212	✓	✓	✓	✓
EP2216876-003	12-Dec-2022 09:51	0089_MW166_221212	✓	✓	✓	✓
EP2216876-004	12-Dec-2022 10:26	0089_MW161_221212	✓	✓	✓	✓
EP2216876-005	12-Dec-2022 11:06	0089_MW199_221212	✓	✓	✓	✓
EP2216876-006	12-Dec-2022 11:06	0089_QC108_221212	✓	✓	✓	✓
EP2216876-007	12-Dec-2022 11:21	0089_MW195D_221212	✓	✓	✓	✓
EP2216876-008	12-Dec-2022 11:24	0089_MW195S_221212	✓	✓	✓	✓
EP2216876-009	12-Dec-2022 11:24	0089_MW193_221212	✓	✓	✓	✓
EP2216876-010	12-Dec-2022 11:30	0089_QC111_221212	✓	✓	✓	✓
EP2216876-011	12-Dec-2022 12:20	0089_MW173_221212	✓	✓	✓	✓
EP2216876-012	12-Dec-2022 12:48	0089_MW197_221212	✓	✓	✓	✓
EP2216876-013	12-Dec-2022 12:50	0089_QC115_221212	✓	✓	✓	✓
EP2216876-014	12-Dec-2022 13:00	0089_MW200_221212	✓	✓	✓	✓
EP2216876-015	12-Dec-2022 13:00	0089_MW158_221212	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216876**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2022
C-O-C number	: 46230	Issue Date	: 30-Dec-2022 17:42
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits for sample #4 and 9 due to analytes not quantified in this report. Major cations (ED093F) and major anions (ED041G/ED045G) have been confirmed by re-analysis.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW171_221212	0089_MW172_221212	0089_MW166_221212	0089_MW161_221212	0089_MW199_221212
				Sampling date / time	12-Dec-2022 11:23	12-Dec-2022 09:24	12-Dec-2022 09:51	12-Dec-2022 10:26	12-Dec-2022 11:06
Compound	CAS Number	LOR	Unit		EP2216876-001	EP2216876-002	EP2216876-003	EP2216876-004	EP2216876-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		492	504	399	640	461
Total Alkalinity as CaCO3	----	1	mg/L		492	504	399	640	461
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		468	198	176	230	179
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		4060	1300	995	609	1450
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		176	108	128	65	81
Magnesium	7439-95-4	1	mg/L		311	129	91	67	97
Sodium	7440-23-5	1	mg/L		2110	723	497	419	831
Potassium	7440-09-7	1	mg/L		88	45	34	35	36
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		134	50.9	39.7	34.8	53.8
ø Total Cations	----	0.01	meq/L		128	48.6	36.4	27.9	49.1
ø Ionic Balance	----	0.01	%		2.17	2.27	4.39	11.0	4.61
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.12	1.67	0.06	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.07	1.56	0.07	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.32	12.7	1.16	0.10	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	2.27	0.18	0.03	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.02	17.9	7.80	4.55	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	0.6	0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.09	0.78	0.39	0.11	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		0.20	3.20	0.35	0.09	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.05	0.28	0.15	0.04	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW171_221212	0089_MW172_221212	0089_MW166_221212	0089_MW161_221212	0089_MW199_221212
				Sampling date / time	12-Dec-2022 11:23	12-Dec-2022 09:24	12-Dec-2022 09:51	12-Dec-2022 10:26	12-Dec-2022 11:06
Compound	CAS Number	LOR	Unit		EP2216876-001	EP2216876-002	EP2216876-003	EP2216876-004	EP2216876-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.01**	**0.75**	**0.10**	**0.02**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW171_221212	0089_MW172_221212	0089_MW166_221212	0089_MW161_221212	0089_MW199_221212
				Sampling date / time	12-Dec-2022 11:23	12-Dec-2022 09:24	12-Dec-2022 09:51	12-Dec-2022 10:26	12-Dec-2022 11:06
					EP2216876-001	EP2216876-002	EP2216876-003	EP2216876-004	EP2216876-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.88**	**41.7**	**10.4**	**4.94**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.34**	**30.6**	**8.96**	**4.65**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.81**	**37.9**	**10.1**	**4.91**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.2**	**94.6**	**104**	**96.4**	**104**
13C8-PFOA	----	0.02	%		**96.9**	**96.8**	**99.5**	**97.1**	**99.8**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC108_221212	0089_MW195D_221212	0089_MW195S_221212	0089_MW193_221212	0089_QC111_221212
				Sampling date / time	12-Dec-2022 11:06	12-Dec-2022 11:21	12-Dec-2022 11:24	12-Dec-2022 11:24	12-Dec-2022 11:30
					EP2216876-006	EP2216876-007	EP2216876-008	EP2216876-009	EP2216876-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**465**	**241**	**576**	**629**	**248**
Total Alkalinity as CaCO3	----	1	mg/L		**465**	**241**	**576**	**629**	**248**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**202**	**1600**	**282**	**86**	**1610**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1780**	**10200**	**928**	**389**	**9460**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**90**	**353**	**166**	**105**	**374**
Magnesium	7439-95-4	1	mg/L		**113**	**739**	**119**	**59**	**781**
Sodium	7440-23-5	1	mg/L		**1000**	**5550**	**487**	**211**	**5850**
Potassium	7440-09-7	1	mg/L		**43**	**250**	**38**	**14**	**264**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**63.7**	**326**	**43.6**	**25.3**	**305**
ø Total Cations	----	0.01	meq/L		**58.4**	**326**	**40.2**	**19.6**	**344**
ø Ionic Balance	----	0.01	%		**4.36**	**0.06**	**3.97**	**12.7**	**5.98**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	**0.37**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	**0.47**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.01**	<0.01	**4.81**	**0.01**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	**0.26**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**1.34**	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	**0.22**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	**0.81**	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC108_221212	0089_MW195D_221212	0089_MW195S_221212	0089_MW193_221212	0089_QC111_221212
				Sampling date / time	12-Dec-2022 11:06	12-Dec-2022 11:21	12-Dec-2022 11:24	12-Dec-2022 11:24	12-Dec-2022 11:30
Compound	CAS Number	LOR	Unit		EP2216876-006	EP2216876-007	EP2216876-008	EP2216876-009	EP2216876-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	**0.08**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.29**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC108_221212	0089_MW195D_221212	0089_MW195S_221212	0089_MW193_221212	0089_QC111_221212
				Sampling date / time	12-Dec-2022 11:06	12-Dec-2022 11:21	12-Dec-2022 11:24	12-Dec-2022 11:24	12-Dec-2022 11:30
Compound	CAS Number	LOR	Unit		EP2216876-006	EP2216876-007	EP2216876-008	EP2216876-009	EP2216876-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.01**	<0.01	**8.65**	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.01**	<0.01	**6.15**	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.01**	<0.01	**7.92**	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.3**	**103**	**100**	**103**	**101**
13C8-PFOA	----	0.02	%		**99.9**	**100**	**100**	**96.7**	**98.2**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW173_221212	0089_MW197_221212	0089_QC115_221212	0089_MW200_221212	0089_MW158_221212
				Sampling date / time	12-Dec-2022 12:20	12-Dec-2022 12:48	12-Dec-2022 12:50	12-Dec-2022 13:00	12-Dec-2022 13:00
Compound	CAS Number	LOR	Unit		EP2216876-011	EP2216876-012	EP2216876-013	EP2216876-014	EP2216876-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		447	574	566	436	448
Total Alkalinity as CaCO3	----	1	mg/L		447	574	566	436	448
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		117	132	138	204	493
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		822	592	641	1950	4430
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		127	54	53	84	190
Magnesium	7439-95-4	1	mg/L		83	133	130	89	320
Sodium	7440-23-5	1	mg/L		386	356	342	1080	2200
Potassium	7440-09-7	1	mg/L		24	25	24	55	100
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		34.6	30.9	32.3	68.0	144
ø Total Cations	----	0.01	meq/L		30.6	29.8	28.8	59.9	134
ø Ionic Balance	----	0.01	%		6.11	1.90	5.61	6.31	3.63
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.22	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.14	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		3.30	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.50	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		6.34	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.16	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		0.43	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.07	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW173_221212	0089_MW197_221212	0089_QC115_221212	0089_MW200_221212	0089_MW158_221212
				Sampling date / time	12-Dec-2022 12:20	12-Dec-2022 12:48	12-Dec-2022 12:50	12-Dec-2022 13:00	12-Dec-2022 13:00
Compound	CAS Number	LOR	Unit		EP2216876-011	EP2216876-012	EP2216876-013	EP2216876-014	EP2216876-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.34**	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW173_221212	0089_MW197_221212	0089_QC115_221212	0089_MW200_221212	0089_MW158_221212
				Sampling date / time	12-Dec-2022 12:20	12-Dec-2022 12:48	12-Dec-2022 12:50	12-Dec-2022 13:00	12-Dec-2022 13:00
Compound	CAS Number	LOR	Unit		EP2216876-011	EP2216876-012	EP2216876-013	EP2216876-014	EP2216876-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**11.5**	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**9.64**	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**10.9**	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**96.2**	**96.9**	**99.4**	**101**
13C8-PFOA	----	0.02	%		**98.7**	**97.9**	**100**	**99.8**	**98.1**

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216876**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2022
C-O-C number	: 46230	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4781468)									
EP2216873-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	178	183	3.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	178	183	3.0	0% - 20%
EP2216873-013	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	136	138	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	136	138	1.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4781469)									
EP2216876-007	0089_MW195D_221212	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	241	244	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	241	244	1.0	0% - 20%
EP2216877-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	134	136	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	134	136	0.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791352)									
EP2216876-001	0089_MW171_221212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	468	468	0.0	0% - 20%
EP2216876-011	0089_MW173_221212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	117	114	3.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791351)									
EP2216876-001	0089_MW171_221212	ED045G: Chloride	16887-00-6	1	mg/L	4060	4020	1.2	0% - 20%
EP2216876-011	0089_MW173_221212	ED045G: Chloride	16887-00-6	1	mg/L	822	815	0.8	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4779120)									
EP2216876-001	0089_MW171_221212	ED093F: Calcium	7440-70-2	1	mg/L	176	178	1.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	311	312	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2110	2100	0.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	88	90	1.9	0% - 20%
EP2216876-011	0089_MW173_221212	ED093F: Calcium	7440-70-2	1	mg/L	127	128	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	83	84	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	386	387	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	24	24	0.0	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4781468)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	100	87.8	118
				<1	200 mg/L	98.1	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 4781469)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	113	87.8	118
				<1	200 mg/L	93.7	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791352)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	93.6	89.9	112
				<1	500 mg/L	104	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791351)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	88.6	113
				<1	1000 mg/L	105	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4779120)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	110	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4788773)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	85.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	92.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	85.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	87.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	99.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	95.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4788773)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4788773) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	97.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	95.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	95.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	98.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788773)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	94.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	94.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	96.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	97.8	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	94.2	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	92.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4788773)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	88.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	88.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	89.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	89.4	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791352)							
EP2216876-001	0089_MW171_221212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791351)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED045G: Chloride by Discrete Analyser (QCLot: 4791351) - continued							
EP2216876-001	0089_MW171_221212	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216876**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling GW - CG	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 15
Order number	: pfas-omp/Stirling	No. of samples analysed	: 15

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216876--001	0089_MW171_221212	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216876--001	0089_MW171_221212	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_MW171_221212,	0089_MW172_221212,	----	----	----	21-Dec-2022	19-Dec-2022	**2**
0089_MW166_221212,	0089_MW161_221212,						
0089_MW199_221212,	0089_QC108_221212,						
0089_MW195D_221212,	0089_MW195S_221212,						
0089_MW193_221212,	0089_QC111_221212,						
0089_MW173_221212,	0089_MW197_221212,						
0089_QC115_221212,	0089_MW200_221212,						
0089_MW158_221212							

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	19	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	19	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW171_221212, 0089_MW172_221212, 0089_MW166_221212, 0089_MW161_221212, 0089_MW199_221212, 0089_QC108_221212, 0089_MW195D_221212, 0089_MW195S_221212, 0089_MW193_221212, 0089_QC111_221212, 0089_MW173_221212, 0089_MW197_221212, 0089_QC115_221212, 0089_MW200_221212, 0089_MW158_221212	**12-Dec-2022**	**----**	----	----	**20-Dec-2022**	26-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW171_221212, 0089_MW172_221212, 0089_MW166_221212, 0089_MW161_221212, 0089_MW199_221212, 0089_QC108_221212, 0089_MW195D_221212, 0089_MW195S_221212, 0089_MW193_221212, 0089_QC111_221212, 0089_MW173_221212, 0089_MW197_221212, 0089_QC115_221212, 0089_MW200_221212, 0089_MW158_221212	**12-Dec-2022**	**----**	----	----	**29-Dec-2022**	09-Jan-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW171_221212, 0089_MW172_221212, 0089_MW166_221212, 0089_MW161_221212, 0089_MW199_221212, 0089_QC108_221212, 0089_MW195D_221212, 0089_MW195S_221212, 0089_MW193_221212, 0089_QC111_221212, 0089_MW173_221212, 0089_MW197_221212, 0089_QC115_221212, 0089_MW200_221212, 0089_MW158_221212	**12-Dec-2022**	**----**	----	----	**29-Dec-2022**	09-Jan-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW171_221212, 0089_MW172_221212, 0089_MW166_221212, 0089_MW161_221212, 0089_MW199_221212, 0089_QC108_221212, 0089_MW195D_221212, 0089_MW195S_221212, 0089_MW193_221212, 0089_QC111_221212, 0089_MW173_221212, 0089_MW197_221212, 0089_QC115_221212, 0089_MW200_221212, 0089_MW158_221212	**12-Dec-2022**	**----**	----	----	**21-Dec-2022**	19-Dec-2022	✗

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW171_221212, 0089_MW172_221212, 0089_MW166_221212, 0089_MW161_221212, 0089_MW199_221212, 0089_QC108_221212, 0089_MW195D_221212, 0089_MW195S_221212, 0089_MW193_221212, 0089_QC111_221212, 0089_MW173_221212, 0089_MW197_221212, 0089_QC115_221212, 0089_MW200_221212, 0089_MW158_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**30-Dec-2022**	10-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW171_221212, 0089_MW172_221212, 0089_MW166_221212, 0089_MW161_221212, 0089_MW199_221212, 0089_QC108_221212, 0089_MW195D_221212, 0089_MW195S_221212, 0089_MW193_221212, 0089_QC111_221212, 0089_MW173_221212, 0089_MW197_221212, 0089_QC115_221212, 0089_MW200_221212, 0089_MW158_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**30-Dec-2022**	10-Jun-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW171_221212, 0089_MW172_221212, 0089_MW166_221212, 0089_MW161_221212, 0089_MW199_221212, 0089_QC108_221212, 0089_MW195D_221212, 0089_MW195S_221212, 0089_MW193_221212, 0089_QC111_221212, 0089_MW173_221212, 0089_MW197_221212, 0089_QC115_221212, 0089_MW200_221212, 0089_MW158_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**30-Dec-2022**	10-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW171_221212, 0089_MW172_221212, 0089_MW166_221212, 0089_MW161_221212, 0089_MW199_221212, 0089_QC108_221212, 0089_MW195D_221212, 0089_MW195S_221212, 0089_MW193_221212, 0089_QC111_221212, 0089_MW173_221212, 0089_MW197_221212, 0089_QC115_221212, 0089_MW200_221212, 0089_MW158_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**30-Dec-2022**	10-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW171_221212, 0089_MW172_221212, 0089_MW166_221212, 0089_MW161_221212, 0089_MW199_221212, 0089_QC108_221212, 0089_MW195D_221212, 0089_MW195S_221212, 0089_MW193_221212, 0089_QC111_221212, 0089_MW173_221212, 0089_MW197_221212, 0089_QC115_221212, 0089_MW200_221212, 0089_MW158_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**30-Dec-2022**	10-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	19	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	19	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2216877

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0069_PFASOMP **Client:** Department of Defence **Project Manager** [redacted]

ALS Compass COC Reference: **# Samples:** **Phone:**

COC NO: 38219; 46231; 46230; 46229; 38223; 38222; 46243; 46245; 46240

Sampler:

Turnaround Requirements: Standard ✓ Urgent **Phone:** [redacted]

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/12/22 ~ 4:00pm	Date / Time: 13/12 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) COC#: 46231 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW370		12/12/2022 01:02 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_PW350		12/12/2022 01:03 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_PW380		12/12/2022 01:04 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_PW401		12/12/2022 01:05 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_PW381		12/12/2022 03:58 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_PW352		12/12/2022 03:59 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_SW353		12/12/2022 03:59 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 46231 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW370	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW350	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW380	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_PW401	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW381	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW352	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_SW353	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 46231 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW370	Clear Plastic Bottle - Natural	500 mL	00070522146754	Green	No	
001	0089_SW370	HDPE (no PTFE)	20 mL	00350522043164	Grey	No	
001	0089_SW370	HDPE (no PTFE)	20 mL	00350522042740	Grey	No	
002	0089_PW350	Clear Plastic Bottle - Natural	500 mL	00070522163783	Green	No	
002	0089_PW350	HDPE (no PTFE)	20 mL	00350522043182	Grey	No	
002	0089_PW350	HDPE (no PTFE)	20 mL	00350522042966	Grey	No	
003	0089_PW380	Clear Plastic Bottle - Natural	500 mL	00070522146724	Green	No	
003	0089_PW380	HDPE (no PTFE)	20 mL	00350522043187	Grey	No	
003	0089_PW380	HDPE (no PTFE)	20 mL	00350522062421	Grey	No	
004	0089_PW401	Clear Plastic Bottle - Natural	500 mL	00070522163820	Green	No	
004	0089_PW401	HDPE (no PTFE)	20 mL	00350522042883	Grey	No	
004	0089_PW401	HDPE (no PTFE)	20 mL	00350522062463	Grey	No	
005	0089_PW381	Clear Plastic Bottle - Natural	500 mL	00070522163772	Green	No	
005	0089_PW381	HDPE (no PTFE)	20 mL	00350522042752	Grey	No	
005	0089_PW381	HDPE (no PTFE)	20 mL	00350522062402	Grey	No	
006	0089_PW352	Clear Plastic Bottle - Natural	500 mL	00070522146744	Green	No	
006	0089_PW352	HDPE (no PTFE)	20 mL	00350522062433	Grey	No	
006	0089_PW352	HDPE (no PTFE)	20 mL	00350522043146	Grey	No	
007	0089_SW353	Clear Plastic Bottle - Natural	500 mL	00070522163802	Green	No	
007	0089_SW353	HDPE (no PTFE)	20 mL	00350522042966	Grey	No	
007	0089_SW353	HDPE (no PTFE)	20 mL	00350522042961	Grey	No	

Total Bottle Count: ALS: 21, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216877**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46231	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 12:30	Issue Date	: 19-Dec-2022
Client Requested Due Date	: 29-Dec-2022	Scheduled Reporting Date	: **29-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2216877-001	12-Dec-2022 13:02	0089_SW370_221212	✓	✓	✓	✓
EP2216877-002	12-Dec-2022 13:03	0089_PW350_221212	✓	✓	✓	✓
EP2216877-003	12-Dec-2022 13:04	0089_PW380_221212	✓	✓	✓	✓
EP2216877-004	12-Dec-2022 13:05	0089_PW401_221212	✓	✓	✓	✓
EP2216877-005	12-Dec-2022 15:58	0089_PW381_221212	✓	✓	✓	✓
EP2216877-006	12-Dec-2022 15:59	0089_PW352_221212	✓	✓	✓	✓
EP2216877-007	12-Dec-2022 15:59	0089_SW353_221212	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216877**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2022
C-O-C number	: 46231	Issue Date	: 29-Dec-2022 14:26
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW370_221212	0089_PW350_221212	0089_PW380_221212	0089_PW401_221212	0089_PW381_221212
				Sampling date / time	12-Dec-2022 13:02	12-Dec-2022 13:03	12-Dec-2022 13:04	12-Dec-2022 13:05	12-Dec-2022 15:58
Compound	CAS Number	LOR	Unit		EP2216877-001	EP2216877-002	EP2216877-003	EP2216877-004	EP2216877-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		148	134	131	128	124
Total Alkalinity as CaCO3	----	1	mg/L		148	134	131	128	124
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2720	2840	2880	2820	2800
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20900	21500	22000	21700	22000
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		464	419	453	419	435
Magnesium	7439-95-4	1	mg/L		1460	1340	1450	1350	1400
Sodium	7440-23-5	1	mg/L		11700	10800	11700	10800	11400
Potassium	7440-09-7	1	mg/L		582	533	574	526	557
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		649	668	683	673	681
ø Total Cations	----	0.01	meq/L		667	614	666	615	647
ø Ionic Balance	----	0.01	%		1.36	4.18	1.31	4.51	2.58
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	0.03	0.02	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.02	<0.01	0.06	0.05	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW370_221212	0089_PW350_221212	0089_PW380_221212	0089_PW401_221212	0089_PW381_221212
				Sampling date / time	12-Dec-2022 13:02	12-Dec-2022 13:03	12-Dec-2022 13:04	12-Dec-2022 13:05	12-Dec-2022 15:58
Compound	CAS Number	LOR	Unit		EP2216877-001	EP2216877-002	EP2216877-003	EP2216877-004	EP2216877-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW370_221212	0089_PW350_221212	0089_PW380_221212	0089_PW401_221212	0089_PW381_221212
				Sampling date / time	12-Dec-2022 13:02	12-Dec-2022 13:03	12-Dec-2022 13:04	12-Dec-2022 13:05	12-Dec-2022 15:58
Compound	CAS Number	LOR	Unit		EP2216877-001	EP2216877-002	EP2216877-003	EP2216877-004	EP2216877-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	<0.01	**0.09**	**0.07**	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	**0.09**	**0.07**	**0.02**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	<0.01	**0.09**	**0.07**	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.1**	**96.6**	**92.3**	**93.4**	**99.3**
13C8-PFOA	----	0.02	%		**102**	**95.6**	**102**	**95.4**	**94.0**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW352_221212	0089_SW353_221212	----	----	----
			Sampling date / time	12-Dec-2022 15:59	12-Dec-2022 15:59	----	----	----
Compound	CAS Number	LOR	Unit	EP2216877-006	EP2216877-007	--------	--------	--------
				Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	127	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	120	127	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2850	2640	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	21800	21200	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	472	416	----	----	----
Magnesium	7439-95-4	1	mg/L	1510	1350	----	----	----
Sodium	7440-23-5	1	mg/L	12200	10900	----	----	----
Potassium	7440-09-7	1	mg/L	601	533	----	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	677	656	----	----	----
ø Total Cations	----	0.01	meq/L	694	620	----	----	----
ø Ionic Balance	----	0.01	%	1.25	2.82	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW352_221212	0089_SW353_221212	----	----	----
				Sampling date / time	12-Dec-2022 15:59	12-Dec-2022 15:59	----	----	----
Compound	CAS Number	LOR	Unit		EP2216877-006	EP2216877-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW352_221212	0089_SW353_221212	----	----	----
			Sampling date / time	12-Dec-2022 15:59	12-Dec-2022 15:59	----	----	----
Compound	CAS Number	LOR	Unit	EP2216877-006	EP2216877-007	--------	--------	--------
				Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	----	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**94.7**	**96.9**	----	----	----
13C8-PFOA	----	0.02	%	**97.1**	**94.6**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216877**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2022
C-O-C number	: 46231	Issue Date	: 29-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4781469)									
EP2216876-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	241	244	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	241	244	1.0	0% - 20%
EP2216877-002	0089_PW350_221212	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	134	136	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	134	136	0.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791350)									
EP2216873-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2950	2850	3.5	0% - 20%
EP2216873-013	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2900	2850	1.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791352)									
EP2216876-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	468	468	0.0	0% - 20%
EP2216876-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	117	114	3.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791349)									
EP2216873-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	21700	22000	1.4	0% - 20%
EP2216873-013	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	22500	21200	6.3	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791351)									
EP2216876-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	4060	4020	1.2	0% - 20%
EP2216876-011	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	822	815	0.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4779120)									
EP2216876-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	176	178	1.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	311	312	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4779120) - continued									
EP2216876-001	Anonymous	ED093F: Sodium	7440-23-5	1	mg/L	2110	2100	0.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	88	90	1.9	0% - 20%
EP2216876-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	127	128	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	83	84	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	386	387	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	24	24	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4779121)									
EP2216877-006	0089_PW352_221212	ED093F: Calcium	7440-70-2	1	mg/L	472	428	9.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1510	1380	9.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12200	11100	9.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	601	541	10.4	0% - 20%
EP2216878-009	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	100	85	16.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	25	20	18.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	43	36	18.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	2	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4786767)									
EP2216873-006	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4786942)									
EP2216878-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2216879-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4786767)									
EP2216873-006	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4786767) - continued									
EP2216873-006	Anonymous	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4786942)									
EP2216878-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2216879-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4786767)									
EP2216873-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4786767) - continued									
EP2216873-006	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4786942)									
EP2216878-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216879-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4786767)									
EP2216873-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4786767) - continued									
EP2216873-006	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4786942)									
EP2216878-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216879-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4786767)									
EP2216873-006	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4786942)									
EP2216878-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2216879-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.03	0.05	50.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4781469)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	113	87.8	118
				<1	200 mg/L	93.7	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791350)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	89.9	112
				<1	500 mg/L	112	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791352)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	93.6	89.9	112
				<1	500 mg/L	104	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791349)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	88.6	113
				<1	1000 mg/L	111	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 4791351)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	88.6	113
				<1	1000 mg/L	105	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4779120)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	110	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.5	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4779121)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.1	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4786767)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	73.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	88.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	80.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	88.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	75.2	65.0	140

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4786767) - continued								
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	86.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4786942)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	95.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	81.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	71.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	69.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	73.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	73.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786767)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	74.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	86.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	87.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	83.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	85.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	92.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786942)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	77.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	77.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	78.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	78.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	81.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	75.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	80.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	73.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	94.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786767)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	80.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	77.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	67.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	85.6	66.0	145

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786767) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	90.1	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	90.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	70.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786942)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	72.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	72.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	67.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	70.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	73.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	85.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	68.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786767)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	81.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	75.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	82.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	78.0	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786942)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	75.4	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	85.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	71.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	82.8	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791350)							
EP2216873-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791352)							
EP2216876-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791349)							
EP2216873-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791351)							
EP2216876-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4786942)							
EP2216878-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	78.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	93.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	85.2	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	86.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	76.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	89.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786942)							
EP2216878-004	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	82.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	91.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	88.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	77.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	94.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	107	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	98.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	116	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786942)							
EP2216878-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	90.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	92.7	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	80.1	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	90.6	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	95.0	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	105	65.0	136

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786942) - continued							
EP2216878-004	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	78.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786942)							
EP2216878-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	97.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	76.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	70.6	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	89.8	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216877**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling SW/PW - CG	Issue Date	: 29-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216873--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216876--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216873--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216876--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
0089_SW370_221212, 0089_PW350_221212, 0089_PW380_221212, 0089_PW401_221212, 0089_PW381_221212, 0089_PW352_221212, 0089_SW353_221212	----	----	----	21-Dec-2022	19-Dec-2022	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	3	40	7.50	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	40	2.50	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW370_221212, 0089_PW350_221212, 0089_PW380_221212, 0089_PW401_221212, 0089_PW381_221212, 0089_PW352_221212, 0089_SW353_221212	**12-Dec-2022**	**----**	----	----	**20-Dec-2022**	26-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW370_221212, 0089_PW350_221212, 0089_PW380_221212, 0089_PW401_221212, 0089_PW381_221212, 0089_PW352_221212	**12-Dec-2022**	**----**	----	----	**28-Dec-2022**	09-Jan-2023	✓
Clear Plastic Bottle - Natural (ED041G)							
0089_SW353_221212	**12-Dec-2022**	**----**	----	----	**29-Dec-2022**	09-Jan-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW370_221212, 0089_PW350_221212, 0089_PW380_221212, 0089_PW401_221212, 0089_PW381_221212, 0089_PW352_221212	**12-Dec-2022**	**----**	----	----	**28-Dec-2022**	09-Jan-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
0089_SW353_221212	**12-Dec-2022**	**----**	----	----	**29-Dec-2022**	09-Jan-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW370_221212, 0089_PW350_221212, 0089_PW380_221212, 0089_PW401_221212, 0089_PW381_221212, 0089_PW352_221212, 0089_SW353_221212	**12-Dec-2022**	**----**	----	----	**21-Dec-2022**	19-Dec-2022	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW370_221212, 0089_PW350_221212, 0089_PW380_221212, 0089_PW401_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X)							
0089_PW381_221212, 0089_PW352_221212, 0089_SW353_221212	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW370_221212, 0089_PW380_221212,	0089_PW350_221212, 0089_PW401_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X)								
0089_PW381_221212, 0089_SW353_221212	0089_PW352_221212,	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_SW370_221212, 0089_PW380_221212,	0089_PW350_221212, 0089_PW401_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X)								
0089_PW381_221212, 0089_SW353_221212	0089_PW352_221212,	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW370_221212, 0089_PW380_221212,	0089_PW350_221212, 0089_PW401_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X)								
0089_PW381_221212, 0089_SW353_221212	0089_PW352_221212,	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_SW370_221212, 0089_PW380_221212,	0089_PW350_221212, 0089_PW401_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X)								
0089_PW381_221212, 0089_SW353_221212	0089_PW352_221212,	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	40	**7.50**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	40	**2.50**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
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Environmental Division
Perth
Work Order Reference
EP2216878

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0059-PFASOMP **Client:** Department of Defence **Project Manager:** [redacted]

ALS Compass COC Reference: [redacted] **# Samples:** **Phone:** [redacted]

COC NO: 38219; 46231; 46230; 46229; 38223; 38222; 46243; 46245; 46240

Sampler:

Turnaround Requirements: Standard ✓ Urgent **Phone:**

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/12/22 ~ 4:00pm	Date / Time: 13/12 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 46240 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW124		12/12/2022 09:03 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
002	0089_MW125		12/12/2022 10:01 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_QC103		12/12/2022 10:01 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_MW126		12/12/2022 11:11 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
005	0089_MW127		12/12/2022 12:12 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_QC113		12/12/2022 12:13 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_MW203		12/12/2022 12:59 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_MW202		12/12/2022 01:19 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_MW288		12/12/2022 02:59 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 46240 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW124	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW125	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_QC103	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW126	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW127	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_QC113	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW203	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW202	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW288	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) *COC#:* **46240** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW124	Clear Plastic Bottle - Natural	500 mL	00070522143320	Green	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350522062644	Grey	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350522062519	Grey	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350621016992	Grey	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350621016800	Grey	No	
002	0089_MW125	HDPE (no PTFE)	20 mL	00350522062551	Grey	No	
002	0089_MW125	HDPE (no PTFE)	20 mL	00350522018082	Grey	No	
002	0089_MW125	Clear Plastic Bottle - Natural	500 mL	00070522143172	Green	No	
003	0089_QC103	Clear Plastic Bottle - Natural	500 mL	00070522143137	Green	No	
003	0089_QC103	HDPE (no PTFE)	20 mL	00350522017835	Grey	No	
003	0089_QC103	HDPE (no PTFE)	20 mL	00350522017904	Grey	No	
004	0089_MW126	Clear Plastic Bottle - Natural	500 mL	00070522143235	Green	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00350522017772	Grey	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00350522017779	Grey	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00350621016667	Grey	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00350621016791	Grey	No	
005	0089_MW127	Clear Plastic Bottle - Natural	500 mL	00070522143301	Green	No	
005	0089_MW127	HDPE (no PTFE)	20 mL	00350522062612	Grey	No	
005	0089_MW127	HDPE (no PTFE)	20 mL	00350522062543	Grey	No	
006	0089_QC113	Clear Plastic Bottle - Natural	500 mL	00070522143203	Green	No	
006	0089_QC113	HDPE (no PTFE)	20 mL	00350522017801	Grey	No	
006	0089_QC113	HDPE (no PTFE)	20 mL	00350522017921	Grey	No	
007	0089_MW203	Clear Plastic Bottle - Natural	500 mL	00070522143263	Green	No	
007	0089_MW203	HDPE (no PTFE)	20 mL	00350522062637	Grey	No	
007	0089_MW203	HDPE (no PTFE)	20 mL	00350522017882	Grey	No	
008	0089_MW202	Clear Plastic Bottle - Natural	500 mL	00070522143294	Green	No	

CHAIN OF CUSTODY

ALS COC#: 46240 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_MW202	HDPE (no PTFE)	20 mL	00350522017827	Grey	No	
008	0089_MW202	HDPE (no PTFE)	20 mL	00350522062648	Grey	No	
009	0089_MW288	Clear Plastic Bottle - Natural	500 mL	00070522143082	Green	No	
009	0089_MW288	HDPE (no PTFE)	20 mL	00350522043139	Grey	No	
009	0089_MW288	HDPE (no PTFE)	20 mL	00350522043004	Grey	No	

Total Bottle Count: ALS: 31, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216878**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46240	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 12:30	Issue Date	: 19-Dec-2022
Client Requested Due Date	: 29-Dec-2022	Scheduled Reporting Date	: **29-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2216878-001	12-Dec-2022 09:03	0089_MW124_221212	✓	✓	✓	✓
EP2216878-002	12-Dec-2022 10:01	0089_MW125_221212	✓	✓	✓	✓
EP2216878-003	12-Dec-2022 10:01	0089_QC103_221212	✓	✓	✓	✓
EP2216878-004	12-Dec-2022 11:11	0089_MW126_221212	✓	✓	✓	✓
EP2216878-005	12-Dec-2022 12:12	0089_MW127_221212	✓	✓	✓	✓
EP2216878-006	12-Dec-2022 12:13	0089_QC113_221212	✓	✓	✓	✓
EP2216878-007	12-Dec-2022 12:59	0089_MW203_221212	✓	✓	✓	✓
EP2216878-008	12-Dec-2022 13:19	0089_MW202_221212	✓	✓	✓	✓
EP2216878-009	12-Dec-2022 14:59	0089_MW288_221212	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216878**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2022
C-O-C number	: 46240	Issue Date	: 30-Dec-2022 16:45
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW124_221212	0089_MW125_221212	0089_QC103_221212	0089_MW126_221212	0089_MW127_221212
				Sampling date / time	12-Dec-2022 09:03	12-Dec-2022 10:01	12-Dec-2022 10:01	12-Dec-2022 11:11	12-Dec-2022 12:12
Compound	CAS Number	LOR	Unit		EP2216878-001	EP2216878-002	EP2216878-003	EP2216878-004	EP2216878-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		423	407	399	765	634
Total Alkalinity as CaCO3	----	1	mg/L		423	407	399	765	634
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		1890	2030	2140	1510	1820
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		14800	15500	16300	15900	14000
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		394	418	486	384	412
Magnesium	7439-95-4	1	mg/L		1020	1080	1240	1070	1140
Sodium	7440-23-5	1	mg/L		7830	8230	9360	7650	8130
Potassium	7440-09-7	1	mg/L		358	374	434	335	365
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		465	488	512	495	445
ø Total Cations	----	0.01	meq/L		453	477	544	448	477
ø Ionic Balance	----	0.01	%		1.30	1.07	3.05	4.95	3.45
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.19	0.19	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.19	0.21	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.69	0.74	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	0.04	0.04	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	0.18	0.15	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW124_221212	0089_MW125_221212	0089_QC103_221212	0089_MW126_221212	0089_MW127_221212
				Sampling date / time	12-Dec-2022 09:03	12-Dec-2022 10:01	12-Dec-2022 10:01	12-Dec-2022 11:11	12-Dec-2022 12:12
Compound	CAS Number	LOR	Unit		EP2216878-001	EP2216878-002	EP2216878-003	EP2216878-004	EP2216878-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW124_221212	0089_MW125_221212	0089_QC103_221212	0089_MW126_221212	0089_MW127_221212
				Sampling date / time	12-Dec-2022 09:03	12-Dec-2022 10:01	12-Dec-2022 10:01	12-Dec-2022 11:11	12-Dec-2022 12:12
					EP2216878-001	EP2216878-002	EP2216878-003	EP2216878-004	EP2216878-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**1.29**	**1.33**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.69**	**0.74**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**1.10**	**1.12**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.8**	**97.2**	**100**	**95.9**	**91.8**
13C8-PFOA	----	0.02	%		**96.8**	**88.6**	**94.0**	**92.9**	**92.9**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC113_221212	0089_MW203_221212	0089_MW202_221212	0089_MW288_221212	----
				Sampling date / time	12-Dec-2022 12:13	12-Dec-2022 12:59	12-Dec-2022 13:19	12-Dec-2022 14:59	----
Compound	CAS Number	LOR	Unit		EP2216878-006	EP2216878-007	EP2216878-008	EP2216878-009	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**602**	**310**	**392**	**355**	----
Total Alkalinity as CaCO3	----	1	mg/L		**602**	**310**	**392**	**355**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1680**	**64**	**82**	**26**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**14400**	**42**	**376**	**68**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**357**	**81**	**96**	**100**	----
Magnesium	7439-95-4	1	mg/L		**1010**	**38**	**34**	**25**	----
Sodium	7440-23-5	1	mg/L		**7160**	**38**	**224**	**43**	----
Potassium	7440-09-7	1	mg/L		**322**	**5**	**17**	**3**	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**453**	**8.71**	**20.1**	**9.55**	----
ø Total Cations	----	0.01	meq/L		**421**	**8.95**	**17.8**	**8.99**	----
ø Ionic Balance	----	0.01	%		**3.73**	**1.35**	**6.27**	**3.01**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.12**	**0.03**	**0.08**	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	**0.03**	**1.80**	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC113_221212	0089_MW203_221212	0089_MW202_221212	0089_MW288_221212	----
				Sampling date / time	12-Dec-2022 12:13	12-Dec-2022 12:59	12-Dec-2022 13:19	12-Dec-2022 14:59	----
Compound	CAS Number	LOR	Unit		EP2216878-006	EP2216878-007	EP2216878-008	EP2216878-009	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC113_221212	0089_MW203_221212	0089_MW202_221212	0089_MW288_221212	----
				Sampling date / time	12-Dec-2022 12:13	12-Dec-2022 12:59	12-Dec-2022 13:19	12-Dec-2022 14:59	----
Compound	CAS Number	LOR	Unit		EP2216878-006	EP2216878-007	EP2216878-008	EP2216878-009	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.12**	**0.06**	**1.88**	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.12**	**0.06**	**1.88**	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.12**	**0.06**	**1.88**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.7**	**97.2**	**91.0**	**98.0**	----
13C8-PFOA	----	0.02	%		**90.8**	**94.6**	**83.9**	**98.4**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216878**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2022
C-O-C number	: 46240	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4781469)									
EP2216876-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	241	244	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	241	244	1.0	0% - 20%
EP2216877-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	134	136	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	134	136	0.9	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4781470)									
EP2216878-005	0089_MW127_221212	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	634	622	2.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	634	622	2.0	0% - 20%
EP2216879-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	135	132	2.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	135	132	2.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791346)									
EP2216878-001	0089_MW124_221212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1890	1880	0.9	0% - 20%
EP2217056-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	252	250	1.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791345)									
EP2216878-001	0089_MW124_221212	ED045G: Chloride	16887-00-6	1	mg/L	14800	15300	2.9	0% - 20%
EP2217056-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	141	142	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4779121)									
EP2216877-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	472	428	9.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1510	1380	9.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12200	11100	9.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	601	541	10.4	0% - 20%
EP2216878-009	0089_MW288_221212	ED093F: Calcium	7440-70-2	1	mg/L	100	85	16.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	25	20	18.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	43	36	18.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	2	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4786942)									
EP2216878-001	0089_MW124_221212	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2216879-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4786942)									
EP2216878-001	0089_MW124_221212	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2216879-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4786942) - continued									
EP2216879-001	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4786942)									
EP2216878-001	0089_MW124_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216879-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4786942)									
EP2216878-001	0089_MW124_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4786942) - continued									
EP2216879-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4786942)									
EP2216878-001	0089_MW124_221212	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2216879-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.03	0.05	50.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4781469)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	113	87.8	118
				<1	200 mg/L	93.7	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 4781470)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	112	87.8	118
				<1	200 mg/L	96.9	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791346)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.5	89.9	112
				<1	500 mg/L	103	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791345)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	88.6	113
				<1	1000 mg/L	97.8	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4779121)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.1	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4786942)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	95.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	81.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	71.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	69.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	73.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	73.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786942)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	77.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	77.8	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786942) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	78.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	78.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	81.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	75.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	80.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	73.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	94.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786942)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	72.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	72.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	67.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	70.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	73.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	85.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	68.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786942)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	75.4	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	85.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	71.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	82.8	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791346)							
EP2216878-001	0089_MW124_221212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791345)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 4791345) - continued							
EP2216878-001	0089_MW124_221212	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4786942)							
EP2216878-004	0089_MW126_221212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	78.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	93.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	85.2	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	86.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	76.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	89.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786942)							
EP2216878-004	0089_MW126_221212	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	82.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	91.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	88.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	77.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	94.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	107	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	98.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	116	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786942)							
EP2216878-004	0089_MW126_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	90.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	92.7	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	80.1	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	90.6	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	95.0	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	105	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	78.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786942)							
EP2216878-004	0089_MW126_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	97.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	76.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	70.6	67.0	138

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786942) - continued							
EP2216878-004	0089_MW126_221212	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	89.8	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216878**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling GW - JS	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216878--001	0089_MW124_221212	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216878--001	0089_MW124_221212	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_MW124_221212,	0089_MW125_221212,	----	----	----	21-Dec-2022	19-Dec-2022	**2**
0089_QC103_221212,	0089_MW126_221212,						
0089_MW127_221212,	0089_QC113_221212,						
0089_MW203_221212,	0089_MW202_221212,						
0089_MW288_221212							

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW124_221212,	0089_MW125_221212,	**12-Dec-2022**	**----**	----	----	**20-Dec-2022**	26-Dec-2022	✓
0089_QC103_221212,	0089_MW126_221212,							
0089_MW127_221212,	0089_QC113_221212,							
0089_MW203_221212,	0089_MW202_221212,							
0089_MW288_221212								

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW124_221212, 0089_MW125_221212, 0089_QC103_221212, 0089_MW126_221212, 0089_MW127_221212, 0089_QC113_221212, 0089_MW203_221212, 0089_MW202_221212, 0089_MW288_221212	**12-Dec-2022**	**----**	----	----	**28-Dec-2022**	09-Jan-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW124_221212, 0089_MW125_221212, 0089_QC103_221212, 0089_MW126_221212, 0089_MW127_221212, 0089_QC113_221212, 0089_MW203_221212, 0089_MW202_221212, 0089_MW288_221212	**12-Dec-2022**	**----**	----	----	**28-Dec-2022**	09-Jan-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW124_221212, 0089_MW125_221212, 0089_QC103_221212, 0089_MW126_221212, 0089_MW127_221212, 0089_QC113_221212, 0089_MW203_221212, 0089_MW202_221212, 0089_MW288_221212	**12-Dec-2022**	**----**	----	----	**21-Dec-2022**	19-Dec-2022	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW124_221212, 0089_MW125_221212, 0089_QC103_221212, 0089_MW126_221212, 0089_MW127_221212, 0089_QC113_221212, 0089_MW203_221212, 0089_MW202_221212, 0089_MW288_221212	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW124_221212, 0089_MW125_221212, 0089_QC103_221212, 0089_MW126_221212, 0089_MW127_221212, 0089_QC113_221212, 0089_MW203_221212, 0089_MW202_221212, 0089_MW288_221212	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW124_221212, 0089_MW125_221212, 0089_QC103_221212, 0089_MW126_221212, 0089_MW127_221212, 0089_QC113_221212, 0089_MW203_221212, 0089_MW202_221212, 0089_MW288_221212	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW124_221212, 0089_MW125_221212, 0089_QC103_221212, 0089_MW126_221212, 0089_MW127_221212, 0089_QC113_221212, 0089_MW203_221212, 0089_MW202_221212, 0089_MW288_221212	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW124_221212, 0089_MW125_221212, 0089_QC103_221212, 0089_MW126_221212, 0089_MW127_221212, 0089_QC113_221212, 0089_MW203_221212, 0089_MW202_221212, 0089_MW288_221212	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2216879

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0069_PFASOMP

Client: Department of Defence

Project Manager: [redacted]

ALS Compass COC Reference:

Samples:

Phone: [redacted]

COC NO: 38219; 46231; 46230; 46229; 38223; 38222; 46243; 46245; 46240

Sampler:

Phone:

Turnaround Requirements: Standard ✓ Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/12/22 ~ 4:00pm	Date / Time: 13/12 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 46243 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW130		12/12/2022 09:14 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
002	0089_PW335		12/12/2022 09:21 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_PW384		12/12/2022 09:37 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_PW340		12/12/2022 10:19 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
005	0089_SW132		12/12/2022 10:30 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_QC104		12/12/2022 10:32 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW362		12/12/2022 10:50 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_QC107		12/12/2022 10:51 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_PW341		12/12/2022 11:24 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 46243 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SW134		12/12/2022 11:39 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
011	0089_QC112		12/12/2022 11:40 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
012	0089_PW363		12/12/2022 11:59 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
013	0089_SW305		12/12/2022 01:35 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
014	0089_PW304		12/12/2022 01:40 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
015	0089_PW368		12/12/2022 02:26 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
016	0089_QC116		12/12/2022 02:29 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
017	0089_SW371		12/12/2022 02:35 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
018	0089_SW373		12/12/2022 03:10 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 46243 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0089_PW346		12/12/2022 03:15 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
020	0089_QC118		12/12/2022 03:15 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
021	0089_SW372		12/12/2022 03:25 PM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

(ALS) COC#: 46243 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW130	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW335	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW364	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_PW340	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_SW132	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_QC104	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW362	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_QC107	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_PW341	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 46243 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

010	0089_SW134	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_QC112	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_PW363	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_SW305	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_PW304	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0089_PW368	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
016	0089_QC116	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
017	0089_SW371	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
018	0089_SW373	Surface Waters WATER	WATER	- NT-01 Major Cations (Ca, Mg, Na, K) - EA025H Suspended Solids - Standard Level - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
019	0089_PW346	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 46243 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

020	0089_QC118	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
021	0089_SW372	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 46243 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW130	HDPE (no PTFE)	20 mL	00350522017908	Grey	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00350522062590	Grey	No	
001	0089_SW130	Clear Plastic Bottle - Natural	500 mL	00070522143368	Green	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00350821034490	Grey	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00350621016929	Grey	No	
002	0089_PW335	HDPE (no PTFE)	20 mL	00350522017836	Grey	No	
002	0089_PW335	HDPE (no PTFE)	20 mL	00350522017777	Grey	No	
002	0089_PW335	Clear Plastic Bottle - Natural	500 mL	00070522143238	Green	No	
003	0089_PW364	Clear Plastic Bottle - Natural	500 mL	00070522143176	Green	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00350522062491	Grey	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00350522017738	Grey	No	
004	0089_PW340	HDPE (no PTFE)	20 mL	00350522062705	Grey	No	
004	0089_PW340	HDPE (no PTFE)	20 mL	00350522017902	Grey	No	
004	0089_PW340	Clear Plastic Bottle - Natural	500 mL	00070522143118	Green	No	
004	0089_PW340	HDPE (no PTFE)	20 mL	00350621016982	Grey	No	
004	0089_PW340	HDPE (no PTFE)	20 mL	00350621016964	Grey	No	
005	0089_SW132	Clear Plastic Bottle - Natural	500 mL	00070522143239	Green	No	
005	0089_SW132	HDPE (no PTFE)	20 mL	00350522017742	Grey	No	
005	0089_SW132	HDPE (no PTFE)	20 mL	00350522017970	Grey	No	
006	0089_QC104	Clear Plastic Bottle - Natural	500 mL	00070522143261	Green	No	
006	0089_QC104	HDPE (no PTFE)	20 mL	00350522018096	Grey	No	
006	0089_QC104	HDPE (no PTFE)	20 mL	00350522017981	Grey	No	
007	0089_PW362	Clear Plastic Bottle - Natural	500 mL	00070522143234	Green	No	
007	0089_PW362	HDPE (no PTFE)	20 mL	00350522062536	Grey	No	
007	0089_PW362	HDPE (no PTFE)	20 mL	00350522017839	Grey	No	
008	0089_QC107	Clear Plastic Bottle - Natural	500 mL	00070522143067	Green	No	

CHAIN OF CUSTODY

(ALS) *COC#:* 46243 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_QC107	HDPE (no PTFE)	20 mL	00350522062675	Grey	No	
008	0089_QC107	HDPE (no PTFE)	20 mL	00350522062589	Grey	No	
009	0089_PW341	Clear Plastic Bottle - Natural	500 mL	00070522143175	Green	No	
009	0089_PW341	HDPE (no PTFE)	20 mL	00350522018031	Grey	No	
009	0089_PW341	HDPE (no PTFE)	20 mL	00350522017737	Grey	No	
010	0089_SW134	Clear Plastic Bottle - Natural	500 mL	00070522143212	Green	No	
010	0089_SW134	HDPE (no PTFE)	20 mL	00350522017855	Grey	No	
010	0089_SW134	HDPE (no PTFE)	20 mL	00350522062495	Grey	No	
011	0089_QC112	Clear Plastic Bottle - Natural	500 mL	00070522143221	Green	No	
011	0089_QC112	HDPE (no PTFE)	20 mL	00350522062620	Grey	No	
011	0089_QC112	HDPE (no PTFE)	20 mL	00350522017800	Grey	No	
012	0089_PW363	Clear Plastic Bottle - Natural	500 mL	00070522143207	Green	No	
012	0089_PW363	HDPE (no PTFE)	20 mL	00350522062529	Grey	No	
012	0089_PW363	HDPE (no PTFE)	20 mL	00350522062678	Grey	No	
013	0089_SW305	HDPE (no PTFE)	20 mL	00350522017787	Grey	No	
013	0089_SW305	HDPE (no PTFE)	20 mL	00350522017778	Grey	No	
013	0089_SW305	Clear Plastic Bottle - Natural	500 mL	00070522143099	Green	No	
014	0089_PW304	HDPE (no PTFE)	20 mL	00350522042892	Grey	No	
014	0089_PW304	Clear Plastic Bottle - Natural	500 mL	00070522143139	Green	No	
014	0089_PW304	HDPE (no PTFE)	20 mL	00350522042922	Grey	No	
015	0089_PW368	HDPE (no PTFE)	20 mL	00350522042845	Grey	No	
015	0089_PW368	Clear Plastic Bottle - Natural	500 mL	00070522143351	Green	No	
015	0089_PW368	HDPE (no PTFE)	20 mL	00350522042934	Grey	No	
016	0089_QC116	Clear Plastic Bottle - Natural	500 mL	00070522143295	Green	No	
016	0089_QC116	HDPE (no PTFE)	20 mL	00350522062602	Grey	No	
016	0089_QC116	HDPE (no PTFE)	20 mL	00350522062636	Grey	No	
017	0089_SW371	HDPE (no PTFE)	20 mL	00350522042957	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 46243 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

017	0089_SW371	HDPE (no PTFE)	20 mL	00350522042890	Grey	No	
017	0089_SW371	Clear Plastic Bottle - Natural	500 mL	00070522143341	Green	No	
018	0089_SW373	HDPE (no PTFE)	20 mL	00350522043095	Grey	No	
018	0089_SW373	Clear Plastic Bottle - Natural	500 mL	00070522143264	Green	No	
018	0089_SW373	HDPE (no PTFE)	20 mL	00350522042744	Grey	No	
019	0089_PW346	Clear Plastic Bottle - Natural	500 mL	00070522143225	Green	No	
019	0089_PW346	HDPE (no PTFE)	20 mL	00350522043126	Grey	No	
019	0089_PW346	HDPE (no PTFE)	20 mL	00350522043073	Grey	No	
020	0089_QC118	HDPE (no PTFE)	20 mL	00350522043107	Grey	No	
020	0089_QC118	Clear Plastic Bottle - Natural	500 mL	00070522143347	Green	No	
020	0089_QC118	HDPE (no PTFE)	20 mL	00350522042804	Grey	No	
021	0089_SW372	HDPE (no PTFE)	20 mL	00350522042834	Grey	No	
021	0089_SW372	HDPE (no PTFE)	20 mL	00350522042904	Grey	No	
021	0089_SW372	HDPE (no PTFE)	20 mL	00350522018014	Grey	No	
021	0089_SW372	HDPE (no PTFE)	20 mL	00350522017857	Grey	No	
021	0089_SW372	Clear Plastic Bottle - Natural	500 mL	00070522143189	Green	No	

Total Bottle Count: ALS: 69, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216879**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46243	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 12:30	Issue Date	: 20-Dec-2022
Client Requested Due Date	: 29-Dec-2022	Scheduled Reporting Date	: **29-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 21 / 21

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA025H Suspended Solids - Standard Level	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2216879-001	12-Dec-2022 09:14	0089_SW130_221212		✓	✓		✓	✓
EP2216879-002	12-Dec-2022 09:21	0089_PW335_221212		✓	✓		✓	✓
EP2216879-003	12-Dec-2022 09:37	0089_PW364_221212		✓	✓		✓	✓
EP2216879-004	12-Dec-2022 10:19	0089_PW340_221212		✓	✓		✓	✓
EP2216879-005	12-Dec-2022 10:30	0089_SW132_221212		✓	✓		✓	✓
EP2216879-006	12-Dec-2022 10:32	0089_QC104_221212		✓	✓		✓	✓
EP2216879-007	12-Dec-2022 10:50	0089_PW362_221212		✓	✓		✓	✓
EP2216879-008	12-Dec-2022 10:51	0089_QC107_221212		✓	✓		✓	✓
EP2216879-009	12-Dec-2022 11:24	0089_PW341_221212		✓	✓		✓	✓
EP2216879-010	12-Dec-2022 11:39	0089_SW134_221212		✓	✓		✓	✓
EP2216879-011	12-Dec-2022 11:40	0089_QC112_221212		✓	✓		✓	✓
EP2216879-012	12-Dec-2022 11:59	0089_PW363_221212		✓	✓		✓	✓
EP2216879-013	12-Dec-2022 13:35	0089_SW305_221212		✓	✓		✓	✓
EP2216879-014	12-Dec-2022 13:40	0089_PW304_221212		✓	✓		✓	✓
EP2216879-015	12-Dec-2022 14:28	0089_PW368_221212		✓	✓		✓	✓
EP2216879-016	12-Dec-2022 14:29	0089_QC116_221212		✓	✓		✓	✓
EP2216879-017	12-Dec-2022 14:35	0089_SW371_221212		✓	✓		✓	✓
EP2216879-018	12-Dec-2022 15:10	0089_SW373_221212	✓	✓	✓	✓		
EP2216879-019	12-Dec-2022 15:15	0089_PW346_221212		✓	✓		✓	✓
EP2216879-020	12-Dec-2022 15:15	0089_QC118_221212		✓	✓		✓	✓
EP2216879-021	12-Dec-2022 15:25	0089_SW372_221212		✓	✓		✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]

DERP LAB REPORTS

- EDI Format - ESDAT (ESDAT)	Email	[redacted]

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216879**	Page	: 1 of 18
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2022
C-O-C number	: 46243	Issue Date	: 30-Dec-2022 13:46
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 21		
No. of samples analysed	: 21		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- ED041G (Turbidimetric Sulfate): LCS recovery falls outside ALS Dynamic Control Limit. However, it is within the acceptance criteria based on ALS DQO. No further action is required.
- ED045G: Chloride result for sample #19 and 20 confirmed by re-preparation and re-analysis.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_221212	0089_PW335_221212	0089_PW364_221212	0089_PW340_221212	0089_SW132_221212
				Sampling date / time	12-Dec-2022 09:14	12-Dec-2022 09:21	12-Dec-2022 09:37	12-Dec-2022 10:19	12-Dec-2022 10:30
Compound	CAS Number	LOR	Unit		EP2216879-001	EP2216879-002	EP2216879-003	EP2216879-004	EP2216879-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		148	188	182	177	138
Total Alkalinity as CaCO3	----	1	mg/L		148	188	182	177	138
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2510	2320	2390	2370	2460
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20600	18700	19900	20200	20600
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		476	446	453	451	457
Magnesium	7439-95-4	1	mg/L		1480	1430	1450	1400	1490
Sodium	7440-23-5	1	mg/L		12100	11500	11800	11300	12100
Potassium	7440-09-7	1	mg/L		585	513	519	495	535
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		636	580	615	623	635
ø Total Cations	----	0.01	meq/L		687	653	668	642	685
ø Ionic Balance	----	0.01	%		3.82	5.98	4.19	1.52	3.81
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	0.06	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.03	0.02	0.04	0.03	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_221212	0089_PW335_221212	0089_PW364_221212	0089_PW340_221212	0089_SW132_221212
				Sampling date / time	12-Dec-2022 09:14	12-Dec-2022 09:21	12-Dec-2022 09:37	12-Dec-2022 10:19	12-Dec-2022 10:30
Compound	CAS Number	LOR	Unit		EP2216879-001	EP2216879-002	EP2216879-003	EP2216879-004	EP2216879-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_221212	0089_PW335_221212	0089_PW364_221212	0089_PW340_221212	0089_SW132_221212
				Sampling date / time	12-Dec-2022 09:14	12-Dec-2022 09:21	12-Dec-2022 09:37	12-Dec-2022 10:19	12-Dec-2022 10:30
Compound	CAS Number	LOR	Unit		EP2216879-001	EP2216879-002	EP2216879-003	EP2216879-004	EP2216879-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.03**	**0.02**	**0.04**	**0.09**	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.03**	**0.02**	**0.04**	**0.09**	**0.02**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	**0.02**	**0.04**	**0.09**	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.4**	**95.8**	**95.1**	**90.8**	**94.9**
13C8-PFOA	----	0.02	%		**92.2**	**94.5**	**95.1**	**92.1**	**94.3**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_QC104_221212	0089_PW362_221212	0089_QC107_221212	0089_PW341_221212	0089_SW134_221212
			Sampling date / time	12-Dec-2022 10:32	12-Dec-2022 10:50	12-Dec-2022 10:51	12-Dec-2022 11:24	12-Dec-2022 11:39
Compound	CAS Number	LOR	Unit	EP2216879-006	EP2216879-007	EP2216879-008	EP2216879-009	EP2216879-010
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	135	168	168	231	136
Total Alkalinity as CaCO3	----	1	mg/L	135	168	168	231	136
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2440	2280	2280	2390	2460
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	20500	18500	18100	19800	20400
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	481	424	429	466	473
Magnesium	7439-95-4	1	mg/L	1560	1340	1350	1420	1540
Sodium	7440-23-5	1	mg/L	12600	10800	11000	11500	12400
Potassium	7440-09-7	1	mg/L	564	480	485	515	555
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	632	573	561	613	629
ø Total Cations	----	0.01	meq/L	715	613	623	654	704
ø Ionic Balance	----	0.01	%	6.17	3.44	5.23	3.21	5.59
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	<0.01	0.01	0.02	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC104_221212	0089_PW362_221212	0089_QC107_221212	0089_PW341_221212	0089_SW134_221212
				Sampling date / time	12-Dec-2022 10:32	12-Dec-2022 10:50	12-Dec-2022 10:51	12-Dec-2022 11:24	12-Dec-2022 11:39
Compound	CAS Number	LOR	Unit		EP2216879-006	EP2216879-007	EP2216879-008	EP2216879-009	EP2216879-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC104_221212	0089_PW362_221212	0089_QC107_221212	0089_PW341_221212	0089_SW134_221212
				Sampling date / time	12-Dec-2022 10:32	12-Dec-2022 10:50	12-Dec-2022 10:51	12-Dec-2022 11:24	12-Dec-2022 11:39
Compound	CAS Number	LOR	Unit		EP2216879-006	EP2216879-007	EP2216879-008	EP2216879-009	EP2216879-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	<0.01	**0.01**	**0.02**	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	**0.01**	**0.02**	**0.02**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	<0.01	**0.01**	**0.02**	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**86.6**	**85.9**	**79.4**	**94.3**	**104**
13C8-PFOA	----	0.02	%		**94.8**	**94.0**	**82.4**	**99.8**	**101**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_QC112_221212	0089_PW363_221212	0089_SW305_221212	0089_PW304_221212	0089_PW368_221212
			Sampling date / time	12-Dec-2022 11:40	12-Dec-2022 11:59	12-Dec-2022 13:35	12-Dec-2022 13:40	12-Dec-2022 14:28
Compound	CAS Number	LOR	Unit	EP2216879-011	EP2216879-012	EP2216879-013	EP2216879-014	EP2216879-015
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**139**	**199**	**149**	**456**	**314**
Total Alkalinity as CaCO3	----	1	mg/L	**139**	**199**	**149**	**456**	**314**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2450**	**2330**	**2400**	**670**	**2210**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**20500**	**21800**	**22300**	**5530**	**16200**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**451**	**454**	**457**	**204**	**409**
Magnesium	7439-95-4	1	mg/L	**1470**	**1390**	**1470**	**444**	**1120**
Sodium	7440-23-5	1	mg/L	**11900**	**11200**	**12000**	**3040**	**8650**
Potassium	7440-09-7	1	mg/L	**529**	**496**	**533**	**130**	**365**
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**632**	**667**	**682**	**179**	**509**
ø Total Cations	----	0.01	meq/L	**675**	**637**	**679**	**182**	**498**
ø Ionic Balance	----	0.01	%	**3.26**	**2.34**	**0.19**	**0.89**	**1.10**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	**0.02**	<0.01	**0.04**	**0.02**	**0.26**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_QC112_221212	0089_PW363_221212	0089_SW305_221212	0089_PW304_221212	0089_PW368_221212
			Sampling date / time	12-Dec-2022 11:40	12-Dec-2022 11:59	12-Dec-2022 13:35	12-Dec-2022 13:40	12-Dec-2022 14:28
Compound	CAS Number	LOR	Unit	EP2216879-011	EP2216879-012	EP2216879-013	EP2216879-014	EP2216879-015
				Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_QC112_221212	0089_PW363_221212	0089_SW305_221212	0089_PW304_221212	0089_PW368_221212
			Sampling date / time	12-Dec-2022 11:40	12-Dec-2022 11:59	12-Dec-2022 13:35	12-Dec-2022 13:40	12-Dec-2022 14:28
Compound	CAS Number	LOR	Unit	EP2216879-011	EP2216879-012	EP2216879-013	EP2216879-014	EP2216879-015
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	**0.02**	<0.01	**0.04**	**0.02**	**0.26**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	**0.02**	<0.01	**0.04**	**0.02**	**0.26**
Sum of PFAS (WA DER List)	----	0.01	µg/L	**0.02**	<0.01	**0.04**	**0.02**	**0.26**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**104**	**105**	**94.2**	**89.4**	**92.5**
13C8-PFOA	----	0.02	%	**98.5**	**103**	**99.2**	**94.7**	**94.0**

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC116_221212	0089_SW371_221212	0089_SW373_221212	0089_PW346_221212	0089_QC118_221212
				Sampling date / time	12-Dec-2022 14:29	12-Dec-2022 14:35	12-Dec-2022 15:10	12-Dec-2022 15:15	12-Dec-2022 15:15
					EP2216879-016	EP2216879-017	EP2216879-018	EP2216879-019	EP2216879-020
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**----**	**----**	**50**	**----**	**----**
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	**4**	**5**
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**308**	**143**	**142**	**242**	**237**
Total Alkalinity as CaCO3	----	1	mg/L		**308**	**143**	**142**	**246**	**242**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2220**	**4210**	**4100**	**179**	**181**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**16400**	**22600**	**22600**	**298**	**268**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**395**	**446**	**444**	**30**	**30**
Magnesium	7439-95-4	1	mg/L		**1100**	**1430**	**1450**	**38**	**36**
Sodium	7440-23-5	1	mg/L		**8540**	**11600**	**11600**	**215**	**202**
Potassium	7440-09-7	1	mg/L		**360**	**516**	**518**	**15**	**14**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**515**	**728**	**726**	**17.0**	**16.2**
ø Total Cations	----	0.01	meq/L		**491**	**658**	**659**	**14.4**	**13.6**
ø Ionic Balance	----	0.01	%		**2.39**	**5.07**	**4.79**	**8.56**	**8.60**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	**0.04**	**0.06**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	**0.04**	**0.05**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	**0.04**	**0.33**	**0.44**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	**0.05**	**0.07**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.22**	**0.07**	**0.22**	**5.54**	**6.88**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC116_221212	0089_SW371_221212	0089_SW373_221212	0089_PW346_221212	0089_QC118_221212
				Sampling date / time	12-Dec-2022 14:29	12-Dec-2022 14:35	12-Dec-2022 15:10	12-Dec-2022 15:15	12-Dec-2022 15:15
Compound	CAS Number	LOR	Unit		EP2216879-016	EP2216879-017	EP2216879-018	EP2216879-019	EP2216879-020
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	**0.03**	**0.05**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	**0.07**	**0.10**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.02**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.03**	**0.05**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC116_221212	0089_SW371_221212	0089_SW373_221212	0089_PW346_221212	0089_QC118_221212
				Sampling date / time	12-Dec-2022 14:29	12-Dec-2022 14:35	12-Dec-2022 15:10	12-Dec-2022 15:15	12-Dec-2022 15:15
Compound	CAS Number	LOR	Unit		EP2216879-016	EP2216879-017	EP2216879-018	EP2216879-019	EP2216879-020
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.22**	**0.07**	**0.26**	**6.13**	**7.72**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.22**	**0.07**	**0.26**	**5.87**	**7.32**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.22**	**0.07**	**0.26**	**6.04**	**7.60**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**88.8**	**93.9**	**96.8**	**95.3**	**99.2**
13C8-PFOA	----	0.02	%		**91.7**	**95.0**	**93.6**	**95.9**	**94.6**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW372_221212	----	----	----	----
				Sampling date / time	12-Dec-2022 15:25	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2216879-021	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**152**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**152**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2580**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20000**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**455**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1420**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**11500**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**560**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**621**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**654**	----	----	----	----
ø Ionic Balance	----	0.01	%		**2.60**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.08**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.60**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW372_221212	----	----	----	----
				Sampling date / time	12-Dec-2022 15:25	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2216879-021	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW372_221212	----	----	----	----
				Sampling date / time	12-Dec-2022 15:25	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2216879-021	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.68**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.68**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.68**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.9**	----	----	----	----
13C8-PFOA	----	0.02	%		**90.9**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216879**	Page	: 1 of 14
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2022
C-O-C number	: 46243	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 21		
No. of samples analysed	: 21		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 4778475)									
EP2216957-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	18	12	44.6	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 4781470)									
EP2216878-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	634	622	2.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	634	622	2.0	0% - 20%
EP2216879-006	0089_QC104_221212	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	135	132	2.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	135	132	2.9	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4781471)									
EP2216879-016	0089_QC116_221212	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	308	310	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	308	310	0.6	0% - 20%
EP2216902-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	393	384	2.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	393	384	2.3	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791200)									
EP2216879-001	0089_SW130_221212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2510	2400	4.3	0% - 20%
EP2216879-011	0089_QC112_221212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2450	2510	2.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791346)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791346) - continued									
EP2216878-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1890	1880	0.9	0% - 20%
EP2217056-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	252	250	1.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791199)									
EP2216879-001	0089_SW130_221212	ED045G: Chloride	16887-00-6	1	mg/L	20600	20600	0.4	0% - 20%
EP2216879-011	0089_QC112_221212	ED045G: Chloride	16887-00-6	1	mg/L	20500	20400	0.3	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791345)									
EP2216878-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	14800	15300	2.9	0% - 20%
EP2217056-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	141	142	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4779127)									
EP2216879-001	0089_SW130_221212	ED093F: Calcium	7440-70-2	1	mg/L	476	472	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1480	1470	0.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12100	12000	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	585	580	0.9	0% - 20%
EP2216879-011	0089_QC112_221212	ED093F: Calcium	7440-70-2	1	mg/L	451	461	2.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1470	1500	1.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11900	12100	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	529	538	1.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4779128)									
EP2216879-021	0089_SW372_221212	ED093F: Calcium	7440-70-2	1	mg/L	455	439	3.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1420	1380	2.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11500	11300	2.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	560	542	3.3	0% - 20%
EP2217214-043	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	308	301	2.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	27000	26500	1.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	81000	79600	1.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	8440	8220	2.8	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4786942)									
EP2216878-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2216879-001	0089_SW130_221212	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4788774)									
EP2216879-021	0089_SW372_221212	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.08	0.06	25.5	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.60	0.50	17.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2216902-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	17.5	18.2	3.8	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	140	148	5.5	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.38	0.43	12.9	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	1.05	1.27	18.8	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	1.54	1.75	12.6	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4786942)									
EP2216878-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2216879-001	0089_SW130_221212	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4788774)									
EP2216879-021	0089_SW372_221212	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4788774) - continued									
EP2216879-021	0089_SW372_221212	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2216902-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.07	1.22	13.2	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.79	0.86	9.3	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	6.04	6.95	14.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.33	0.37	10.3	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.04	0.05	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.2	0.2	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4786942)									
EP2216878-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216879-001	0089_SW130_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4786942) - continued									
EP2216879-001	0089_SW130_221212	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4788774)									
EP2216879-021	0089_SW372_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216902-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4786942)									
EP2216878-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4786942) - continued									
EP2216879-001	0089_SW130_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4788774)									
EP2216879-021	0089_SW372_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216902-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4786942)									
EP2216878-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2216879-001	0089_SW130_221212	EP231X: Sum of PFAS	----	0.01	µg/L	0.03	0.05	50.0	No Limit
EP231P: PFAS Sums (QC Lot: 4788774)									
EP2216879-021	0089_SW372_221212	EP231X: Sum of PFAS	----	0.01	µg/L	0.68	0.56	19.4	0% - 20%
EP2216902-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	169	179	5.9	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4778475)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	95 mg/L	105	89.8	116
				<5	1000 mg/L	102	89.8	116
ED037P: Alkalinity by PC Titrator (QCLot: 4781470)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-00 1	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	112	87.8	118
				<1	200 mg/L	96.9	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 4781471)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-00 1	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	108	87.8	118
				<1	200 mg/L	95.3	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791200)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	92.8	89.9	112
				<1	500 mg/L	# 86.8	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791346)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.5	89.9	112
				<1	500 mg/L	103	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791199)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	88.6	113
				<1	1000 mg/L	102	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 4791345)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	88.6	113
				<1	1000 mg/L	97.8	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4779127)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	106	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.8	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4779128)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 4779128) - continued								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	106	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4786942)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	95.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	81.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	71.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	69.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	73.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	73.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4788773)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	85.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	92.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	85.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	87.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	99.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	95.2	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4788774)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	79.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	105	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	91.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	96.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	81.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	102	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786942)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	77.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	77.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	78.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	78.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	81.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	75.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	80.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	73.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	94.1	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4788773)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4788773) - continued								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	97.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	95.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	95.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	98.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4788774)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	85.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	81.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	98.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	91.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	123	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786942)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	72.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	72.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	67.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	70.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	73.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	85.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	68.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788773)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	94.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	94.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	96.0	62.6	147

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788773) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	97.8	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	94.2	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	92.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788774)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	82.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	76.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	88.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	99.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	83.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	83.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786942)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	75.4	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	85.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	71.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	82.8	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4788773)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	88.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	88.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	89.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	89.4	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4788774)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	105	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	78.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	97.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	76.0	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791200)							
EP2216879-001	0089_SW130_221212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791346)							
EP2216878-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791199)							
EP2216879-001	0089_SW130_221212	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791345)							
EP2216878-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4786942)							
EP2216878-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	78.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	93.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	85.2	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	86.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	76.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	89.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4788774)							
EP2216902-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	86.0	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	110	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	96.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	107	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	91.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	111	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786942)							
EP2216878-004	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	82.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	91.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	88.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	77.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	94.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	107	72.0	134

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4786942) - continued							
EP2216878-004	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	98.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	116	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4788774)							
EP2216902-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	94.9	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	107	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	100	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	87.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	104	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	110	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	96.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	124	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	115	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	126	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4786942)							
EP2216878-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	90.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	92.7	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	80.1	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	90.6	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	95.0	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	105	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	78.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788774)							
EP2216902-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	95.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	93.2	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	89.5	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	116	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	121	65.0	136

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788774) - continued							
EP2216902-006	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	87.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4786942)							
EP2216878-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	97.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	76.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	70.6	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	89.8	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4788774)							
EP2216902-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	81.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	74.8	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216879**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling SW/PW - JS	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 21
Order number	: pfas-omp/Stirling	No. of samples analysed	: 21

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	QC-MRG2-47911990	----	**Sulfate as SO4 - Turbidimetric**	14808-79-8	86.8 %	89.9-112%	**Recovery less than lower control limit**
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216879--001	0089_SW130_221212	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216878--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216879--001	0089_SW130_221212	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216878--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_SW130_221212,	0089_PW335_221212,	----	----	----	28-Dec-2022	19-Dec-2022	**9**
0089_PW364_221212,	0089_PW340_221212,						
0089_SW132_221212,	0089_QC104_221212,						
0089_PW362_221212,	0089_QC107_221212,						
0089_PW341_221212,	0089_SW134_221212,						
0089_QC112_221212,	0089_PW363_221212,						
0089_SW305_221212,	0089_PW304_221212,						
0089_PW368_221212,	0089_QC116_221212,						
0089_SW371_221212,	0089_SW373_221212,						
0089_PW346_221212,	0089_QC118_221212,						
0089_SW372_221212							

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	4	58	6.90	10.00	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	58	3.45	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
0089_SW373_221212	**12-Dec-2022**	**----**	----	----	**19-Dec-2022**	19-Dec-2022	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW130_221212, 0089_PW335_221212, 0089_PW364_221212, 0089_PW340_221212, 0089_SW132_221212, 0089_QC104_221212, 0089_PW362_221212, 0089_QC107_221212, 0089_PW341_221212, 0089_SW134_221212, 0089_QC112_221212, 0089_PW363_221212, 0089_SW305_221212, 0089_PW304_221212, 0089_PW368_221212, 0089_QC116_221212, 0089_SW371_221212, 0089_SW373_221212, 0089_PW346_221212, 0089_QC118_221212, 0089_SW372_221212	**12-Dec-2022**	**----**	----	----	**20-Dec-2022**	26-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW372_221212	**12-Dec-2022**	**----**	----	----	**28-Dec-2022**	09-Jan-2023	✓
Clear Plastic Bottle - Natural (ED041G)							
0089_SW130_221212, 0089_PW335_221212, 0089_PW364_221212, 0089_PW340_221212, 0089_SW132_221212, 0089_QC104_221212, 0089_PW362_221212, 0089_QC107_221212, 0089_PW341_221212, 0089_SW134_221212, 0089_QC112_221212, 0089_PW363_221212, 0089_SW305_221212, 0089_PW304_221212, 0089_PW368_221212, 0089_QC116_221212, 0089_SW371_221212, 0089_SW373_221212, 0089_PW346_221212, 0089_QC118_221212	**12-Dec-2022**	**----**	----	----	**29-Dec-2022**	09-Jan-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW372_221212	**12-Dec-2022**	**----**	----	----	**28-Dec-2022**	09-Jan-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
0089_SW130_221212, 0089_PW335_221212, 0089_PW364_221212, 0089_PW340_221212, 0089_SW132_221212, 0089_QC104_221212, 0089_PW362_221212, 0089_QC107_221212, 0089_PW341_221212, 0089_SW134_221212, 0089_QC112_221212, 0089_PW363_221212, 0089_SW305_221212, 0089_PW304_221212, 0089_PW368_221212, 0089_QC116_221212, 0089_SW371_221212, 0089_SW373_221212, 0089_PW346_221212, 0089_QC118_221212	**12-Dec-2022**	**----**	----	----	**29-Dec-2022**	09-Jan-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW130_221212, 0089_PW335_221212, 0089_PW364_221212, 0089_PW340_221212, 0089_SW132_221212, 0089_QC104_221212, 0089_PW362_221212, 0089_QC107_221212, 0089_PW341_221212, 0089_SW134_221212, 0089_QC112_221212, 0089_PW363_221212, 0089_SW305_221212, 0089_PW304_221212, 0089_PW368_221212, 0089_QC116_221212, 0089_SW371_221212, 0089_SW373_221212, 0089_PW346_221212, 0089_QC118_221212, 0089_SW372_221212	**12-Dec-2022**	**----**	----	----	**28-Dec-2022**	19-Dec-2022	✗

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_SW305_221212, 0089_PW304_221212, 0089_PW368_221212, 0089_QC116_221212, 0089_SW371_221212, 0089_SW373_221212, 0089_PW346_221212, 0089_QC118_221212, 0089_SW372_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X) 0089_PW341_221212, 0089_SW134_221212, 0089_QC112_221212, 0089_PW363_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**30-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X) 0089_SW130_221212, 0089_PW335_221212, 0089_PW364_221212, 0089_PW340_221212, 0089_SW132_221212, 0089_QC104_221212, 0089_PW362_221212, 0089_QC107_221212	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0089_SW305_221212, 0089_PW304_221212, 0089_PW368_221212, 0089_QC116_221212, 0089_SW371_221212, 0089_SW373_221212, 0089_PW346_221212, 0089_QC118_221212, 0089_SW372_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X) 0089_PW341_221212, 0089_SW134_221212, 0089_QC112_221212, 0089_PW363_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**30-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X) 0089_SW130_221212, 0089_PW335_221212, 0089_PW364_221212, 0089_PW340_221212, 0089_SW132_221212, 0089_QC104_221212, 0089_PW362_221212, 0089_QC107_221212	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0089_SW305_221212, 0089_PW304_221212, 0089_PW368_221212, 0089_QC116_221212, 0089_SW371_221212, 0089_SW373_221212, 0089_PW346_221212, 0089_QC118_221212, 0089_SW372_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X) 0089_PW341_221212, 0089_SW134_221212, 0089_QC112_221212, 0089_PW363_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**30-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X) 0089_SW130_221212, 0089_PW335_221212, 0089_PW364_221212, 0089_PW340_221212, 0089_SW132_221212, 0089_QC104_221212, 0089_PW362_221212, 0089_QC107_221212	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_SW305_221212, 0089_PW304_221212, 0089_PW368_221212, 0089_QC116_221212, 0089_SW371_221212, 0089_SW373_221212, 0089_PW346_221212, 0089_QC118_221212, 0089_SW372_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X) 0089_PW341_221212, 0089_SW134_221212, 0089_QC112_221212, 0089_PW363_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**30-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X) 0089_SW130_221212, 0089_PW335_221212, 0089_PW364_221212, 0089_PW340_221212, 0089_SW132_221212, 0089_QC104_221212, 0089_PW362_221212, 0089_QC107_221212	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW305_221212, 0089_PW304_221212, 0089_PW368_221212, 0089_QC116_221212, 0089_SW371_221212, 0089_SW373_221212, 0089_PW346_221212, 0089_QC118_221212, 0089_SW372_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X)							
0089_PW341_221212, 0089_SW134_221212, 0089_QC112_221212, 0089_PW363_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**30-Dec-2022**	10-Jun-2023	✓
HDPE (no PTFE) (EP231X)							
0089_SW130_221212, 0089_PW335_221212, 0089_PW364_221212, 0089_PW340_221212, 0089_SW132_221212, 0089_QC104_221212, 0089_PW362_221212, 0089_QC107_221212	**12-Dec-2022**	**24-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	58	**6.90**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	58	**5.17**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	3	**66.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	58	**5.17**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	58	**3.45**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2216880

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0069_PFASOMP **Client:** Department of Defence **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: **# Samples:** **Sampler:**

COC NO: 38219; 46231; 46230; 46229; 38223; 38222; 46243; 46245; 46240

Phone: [redacted]

Turnaround Requirements: Standard ✓ Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/12/22 ~ 4:00pm	Date / Time: 13/12 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 46245 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD335		12/12/2022 09:22 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD364		12/12/2022 09:39 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_QC102		12/12/2022 09:40 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD340		12/12/2022 10:20 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD362		12/12/2022 10:54 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD341		12/12/2022 11:22 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_QC110		12/12/2022 11:23 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
008	0089_SD363		12/12/2022 11:57 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
009	0089_SD304		12/12/2022 01:42 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 46245 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SD368		12/12/2022 02:30 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
011	0089_QC117		12/12/2022 02:31 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
012	0089_SD346		12/12/2022 03:40 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 46245 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD335	HDPE Soil Jar	200 mL	00620322054446	Grey	No	
002	0089_SD364	HDPE Soil Jar	200 mL	00620322054469	Grey	No	
003	0089_QC102	HDPE Soil Jar	200 mL	00620322054389	Grey	No	
004	0089_SD340	HDPE Soil Jar	200 mL	00620322054486	Grey	No	
005	0089_SD362	HDPE Soil Jar	200 mL	00620322095527	Grey	No	
006	0089_SD341	HDPE Soil Jar	200 mL	00620322054391	Grey	No	
007	0089_QC110	HDPE Soil Jar	200 mL	00620322095482	Grey	No	
008	0089_SD363	HDPE Soil Jar	200 mL	00620322054408	Grey	No	
009	0089_SD304	HDPE Soil Jar	200 mL	00620322054402	Grey	No	
010	0089_SD368	HDPE Soil Jar	200 mL	00620322054423	Grey	No	
011	0089_QC117	HDPE Soil Jar	200 mL	00620322095507	Grey	No	
012	0089_SD346	HDPE Soil Jar	200 mL	00620322095601	Grey	No	

Total Bottle Count: ALS: 12, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216880**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46245	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 12:30	Issue Date	: 19-Dec-2022
Client Requested Due Date	: 30-Dec-2022	Scheduled Reporting Date	: **30-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 12 / 12

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2216880-001	12-Dec-2022 09:22	0089_SD335_221212	✓	✓
EP2216880-002	12-Dec-2022 09:39	0089_SD364_221212	✓	✓
EP2216880-003	12-Dec-2022 09:40	0089_QC102_221212	✓	✓
EP2216880-004	12-Dec-2022 10:20	0089_SD340_221212	✓	✓
EP2216880-005	12-Dec-2022 10:54	0089_SD362_221212	✓	✓
EP2216880-006	12-Dec-2022 11:22	0089_SD341_221212	✓	✓
EP2216880-007	12-Dec-2022 11:23	0089_QC110_221212	✓	✓
EP2216880-008	12-Dec-2022 11:57	0089_SD363_221212	✓	✓
EP2216880-009	12-Dec-2022 13:42	0089_SD304_221212	✓	✓
EP2216880-010	12-Dec-2022 14:30	0089_SD368_221212	✓	✓
EP2216880-011	12-Dec-2022 14:31	0089_QC117_221212	✓	✓
EP2216880-012	12-Dec-2022 15:40	0089_SD346_221212	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216880**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 22-Dec-2022
C-O-C number	: 46245	Issue Date	: 28-Dec-2022 12:08
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD335_221212	0089_SD364_221212	0089_QC102_221212	0089_SD340_221212	0089_SD362_221212
				Sampling date / time	12-Dec-2022 09:22	12-Dec-2022 09:39	12-Dec-2022 09:40	12-Dec-2022 10:20	12-Dec-2022 10:54
					EP2216880-001	EP2216880-002	EP2216880-003	EP2216880-004	EP2216880-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**34.1**	**33.6**	**33.4**	**33.5**	**32.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0003**	**0.0002**	**0.0002**	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD335_221212	0089_SD364_221212	0089_QC102_221212	0089_SD340_221212	0089_SD362_221212
				Sampling date / time	12-Dec-2022 09:22	12-Dec-2022 09:39	12-Dec-2022 09:40	12-Dec-2022 10:20	12-Dec-2022 10:54
Compound	CAS Number	LOR	Unit		EP2216880-001	EP2216880-002	EP2216880-003	EP2216880-004	EP2216880-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0003**	**0.0002**	**0.0002**	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0003**	**0.0002**	**0.0002**	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0003**	**0.0002**	**0.0002**	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**109**	**82.0**	**105**	**92.5**	**109**
13C8-PFOA	----	0.0002	%		**99.5**	**99.0**	**120**	**102**	**103**

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD341_221212	0089_QC110_221212	0089_SD363_221212	0089_SD304_221212	0089_SD368_221212
				Sampling date / time	12-Dec-2022 11:22	12-Dec-2022 11:23	12-Dec-2022 11:57	12-Dec-2022 13:42	12-Dec-2022 14:30
					EP2216880-006	EP2216880-007	EP2216880-008	EP2216880-009	EP2216880-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**33.0**	**30.4**	**32.2**	**38.3**	**36.2**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0009**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD341_221212	0089_QC110_221212	0089_SD363_221212	0089_SD304_221212	0089_SD368_221212
				Sampling date / time	12-Dec-2022 11:22	12-Dec-2022 11:23	12-Dec-2022 11:57	12-Dec-2022 13:42	12-Dec-2022 14:30
Compound	CAS Number	LOR	Unit		EP2216880-006	EP2216880-007	EP2216880-008	EP2216880-009	EP2216880-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0009**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0009**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0009**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**96.5**	**85.5**	**94.5**	**104**	**116**
13C8-PFOA	----	0.0002	%		**103**	**104**	**109**	**104**	**97.5**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_QC117_221212	0089_SD346_221212	----	----	----
			Sampling date / time	12-Dec-2022 14:31	12-Dec-2022 15:40	----	----	----
Compound	CAS Number	LOR	Unit	EP2216880-011	EP2216880-012	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**35.2**	**32.2**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	**0.0002**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0009**	**0.0097**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_QC117_221212	0089_SD346_221212	----	----	----
				Sampling date / time	12-Dec-2022 14:31	12-Dec-2022 15:40	----	----	----
Compound	CAS Number	LOR	Unit		EP2216880-011	EP2216880-012	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0009**	**0.0099**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0009**	**0.0099**	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0009**	**0.0099**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**112**	**102**	----	----	----
13C8-PFOA	----	0.0002	%		**104**	**107**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216880**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 22-Dec-2022
C-O-C number	: 46245	Issue Date	: 28-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4788453)									
EP2216874-003	Anonymous	EA055: Moisture Content	----	0.1	%	29.9	29.2	2.3	0% - 20%
EP2217117-004	Anonymous	EA055: Moisture Content	----	0.1	%	0.6	0.2	102	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4788457)									
EP2216874-008	Anonymous	EA055: Moisture Content	----	0.1	%	28.4	27.2	4.5	0% - 20%
EP2216880-011	0089_QC117_221212	EA055: Moisture Content	----	0.1	%	35.2	35.9	1.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4787998)									
EP2216880-001	0089_SD335_221212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2216880-011	0089_QC117_221212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0009	0.0006	31.8	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4787998)									
EP2216880-001	0089_SD335_221212	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4787998) - continued									
EP2216880-001	0089_SD335_221212	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2216880-011	0089_QC117_221212	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4787998)									
EP2216880-001	0089_SD335_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2216880-011	0089_QC117_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4787998) - continued									
EP2216880-011	0089_QC117_221212	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4787998)									
EP2216880-001	0089_SD335_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2216880-011	0089_QC117_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4787998)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4787998)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	98.4	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4787998)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	127	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.9	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.0	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	113	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4787998)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	112	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	116	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4787998) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	94.4	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4787998)							
EP2216880-001	0089_SD335_221212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	86.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	112	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	118	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	95.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	94.4	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	104	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4787998)							
EP2216880-001	0089_SD335_221212	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	106	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	114	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	120	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	112	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	118	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	114	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	114	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	122	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	122	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	111	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4787998)							
EP2216880-001	0089_SD335_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	119	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	123	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	116	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	122	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	124	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	116	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4787998) - continued							
EP2216880-001	0089_SD335_221212	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	103	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4787998)							
EP2216880-001	0089_SD335_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	114	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	108	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	124	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	120	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216880**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling SD - JS	Issue Date	: 28-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 12
Order number	: pfas-omp/Stirling	No. of samples analysed	: 12

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD335_221212, 0089_SD364_221212, 0089_QC102_221212, 0089_SD340_221212, 0089_SD362_221212, 0089_SD341_221212, 0089_QC110_221212, 0089_SD363_221212, 0089_SD304_221212, 0089_SD368_221212, 0089_QC117_221212, 0089_SD346_221212	**12-Dec-2022**	**----**	----	----	**22-Dec-2022**	26-Dec-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_221212, 0089_SD364_221212, 0089_QC102_221212, 0089_SD340_221212, 0089_SD362_221212, 0089_SD341_221212, 0089_QC110_221212, 0089_SD363_221212, 0089_SD304_221212, 0089_SD368_221212, 0089_QC117_221212, 0089_SD346_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**28-Dec-2022**	31-Jan-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_221212, 0089_SD364_221212, 0089_QC102_221212, 0089_SD340_221212, 0089_SD362_221212, 0089_SD341_221212, 0089_QC110_221212, 0089_SD363_221212, 0089_SD304_221212, 0089_SD368_221212, 0089_QC117_221212, 0089_SD346_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**28-Dec-2022**	31-Jan-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD335_221212, 0089_SD364_221212, 0089_QC102_221212, 0089_SD340_221212, 0089_SD362_221212, 0089_SD341_221212, 0089_QC110_221212, 0089_SD363_221212, 0089_SD304_221212, 0089_SD368_221212, 0089_QC117_221212, 0089_SD346_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**28-Dec-2022**	31-Jan-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_221212, 0089_SD364_221212, 0089_QC102_221212, 0089_SD340_221212, 0089_SD362_221212, 0089_SD341_221212, 0089_QC110_221212, 0089_SD363_221212, 0089_SD304_221212, 0089_SD368_221212, 0089_QC117_221212, 0089_SD346_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**28-Dec-2022**	31-Jan-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD335_221212, 0089_SD364_221212, 0089_QC102_221212, 0089_SD340_221212, 0089_SD362_221212, 0089_SD341_221212, 0089_QC110_221212, 0089_SD363_221212, 0089_SD304_221212, 0089_SD368_221212, 0089_QC117_221212, 0089_SD346_221212	**12-Dec-2022**	**22-Dec-2022**	10-Jun-2023	✓	**28-Dec-2022**	31-Jan-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

ALS Use Only

Custody Document for Submissions via ALS Compass App

Project: WA_0069_PFASOMP **Client:** Department of Defence **Project Manager:** [redacted]

Phone: (

ALS Compass COC Reference: **# Samples:** **Sampler:**

COC NO: 38219; 46231; 46230; 46229; 38223; 38222; 46243; 46245; 46240 **Phone:** (

Turnaround Requirements: Standard ✓ Urgent

Environmental Division
Perth
Work Order Reference
EP2216902

Telephone : +61-8-9406 1301

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by
[redacted]	[redacted]		
Date / Time: 12/12/22 ~ 4:00pm	Date / Time: 13/12 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 38219 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW139		12/12/2022 09:19 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_MW141		12/12/2022 09:37 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_QC101		12/12/2022 09:38 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab QC
004	0089_MW142		12/12/2022 10:19 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_MW149		12/12/2022 11:21 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
006	0089_MW123		12/12/2022 12:36 PM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab QC
007	0089_QC114		12/12/2022 12:37 PM	WATER	ALS: 2 Non ALS: 0	No		X		
008	0089_MW120		12/12/2022 12:54 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
009	0089_MW121		12/12/2022 01:06 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

ALS COC#: 38219 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW500		12/12/2022 01:16 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
011	0089_MW112		12/12/2022 01:25 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
012	0089_MW109		12/12/2022 01:35 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
013	0089_MW128		12/12/2022 01:52 PM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8			lab QC
014	0089_QC301			WATER	ALS: 0 Non ALS: 0	No		X		
015	0089_QC302			WATER	ALS: 0 Non ALS: 0	No		X		
016	0089_QC303			WATER	ALS: 0 Non ALS: 0	No		X		
017	0089_QC401			WATER	ALS: 0 Non ALS: 0	No		X		
018	0089_QC402			WATER	ALS: 0 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 38219 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0089_QC403			WATER	ALS: 0 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 38219 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW139	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW141	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_QC101	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW142	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW149	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW123	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW120	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW121	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
010	0089_MW500	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 38219 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

011	0089_MW112	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_MW109	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_MW128	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 38219 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW139	Clear Plastic Bottle - Natural	500 mL	00070522143091	Green	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00350522042972	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00350522043108	Grey	No	
002	0089_MW141	HDPE (no PTFE)	20 mL	00350522042875	Grey	No	
002	0089_MW141	Clear Plastic Bottle - Natural	500 mL	00070522143373	Green	No	
002	0089_MW141	HDPE (no PTFE)	20 mL	00350522042981	Grey	No	
003	0089_QC101	Clear Plastic Bottle - Natural	500 mL	00070522143046	Green	No	
003	0089_QC101	HDPE (no PTFE)	20 mL	00350821000290	Grey	No	
003	0089_QC101	HDPE (no PTFE)	20 mL	00350522042971	Grey	No	
003	0089_QC101	HDPE (no PTFE)	20 mL	00350522043047	Grey	No	
003	0089_QC101	HDPE (no PTFE)	20 mL	00350821000292	Grey	No	
004	0089_MW142	HDPE (no PTFE)	20 mL	00350522043050	Grey	No	
004	0089_MW142	Clear Plastic Bottle - Natural	500 mL	00070522143326	Green	No	
004	0089_MW142	HDPE (no PTFE)	20 mL	00350522043104	Grey	No	
005	0089_MW149	Clear Plastic Bottle - Natural	500 mL	00070522143398	Green	No	
005	0089_MW149	HDPE (no PTFE)	20 mL	00350522043076	Grey	No	
005	0089_MW149	HDPE (no PTFE)	20 mL	00350522043062	Grey	No	
006	0089_MW123	HDPE (no PTFE)	20 mL	00350522043023	Grey	No	
006	0089_MW123	HDPE (no PTFE)	20 mL	00350821000305	Grey	No	
006	0089_MW123	HDPE (no PTFE)	20 mL	00350522043170	Grey	No	
006	0089_MW123	HDPE (no PTFE)	20 mL	00350821000242	Grey	No	
006	0089_MW123	Clear Plastic Bottle - Natural	500 mL	00070522143265	Green	No	
007	0089_QC114	HDPE (no PTFE)	20 mL	00350019012127	Grey	No	
007	0089_QC114	HDPE (no PTFE)	20 mL	00350019015243	Grey	No	
008	0089_MW120	Clear Plastic Bottle - Natural	500 mL	00070522143143	Green	No	
008	0089_MW120	HDPE (no PTFE)	20 mL	00350522062405	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 38219 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

008	0089_MW120	HDPE (no PTFE)	20 mL	00350522043011	Grey	No	
009	0089_MW121	HDPE (no PTFE)	20 mL	00350522043189	Grey	No	
009	0089_MW121	HDPE (no PTFE)	20 mL	00350522043067	Grey	No	
009	0089_MW121	Clear Plastic Bottle - Natural	500 mL	00070522143130	Green	No	
010	0089_MW500	Clear Plastic Bottle - Natural	500 mL	00070522143357	Green	No	
010	0089_MW500	HDPE (no PTFE)	20 mL	00350522042992	Grey	No	
010	0089_MW500	HDPE (no PTFE)	20 mL	00350522042853	Grey	No	
011	0089_MW112	Clear Plastic Bottle - Natural	500 mL	00070522143395	Green	No	
011	0089_MW112	HDPE (no PTFE)	20 mL	00350522043133	Grey	No	
011	0089_MW112	HDPE (no PTFE)	20 mL	00350522042724	Grey	No	
012	0089_MW109	HDPE (no PTFE)	20 mL	00350522043182	Grey	No	
012	0089_MW109	HDPE (no PTFE)	20 mL	00350522042998	Grey	No	
012	0089_MW109	Clear Plastic Bottle - Natural	500 mL	00070522143181	Green	No	
013	0089_MW128	Clear Plastic Bottle - Natural	500 mL	00070522143110	Green	No	
013	0089_MW128	HDPE (no PTFE)	20 mL	00350821000462	Grey	No	
013	0089_MW128	HDPE (no PTFE)	20 mL	00350522043000	Grey	No	
013	0089_MW128	HDPE (no PTFE)	20 mL	00350821000435	Grey	No	
013	0089_MW128	HDPE (no PTFE)	20 mL	00350522042694	Grey	No	

Total Bottle Count: ALS: 44, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216902**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38219	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 12:30	Issue Date	: 16-Dec-2022
Client Requested Due Date	: 29-Dec-2022	Scheduled Reporting Date	: **29-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 19 / 19

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2216902-001	12-Dec-2022 09:19	0089_MW139_221212	✓	✓	✓	✓
EP2216902-002	12-Dec-2022 09:37	0089_MW141_221212	✓	✓	✓	✓
EP2216902-003	12-Dec-2022 09:38	0089_QC101_221212	✓	✓	✓	✓
EP2216902-004	12-Dec-2022 10:19	0089_MW142_221212	✓	✓	✓	✓
EP2216902-005	12-Dec-2022 11:21	0089_MW149_221212	✓	✓	✓	✓
EP2216902-006	12-Dec-2022 12:36	0089_MW123_221212	✓	✓	✓	✓
EP2216902-007	12-Dec-2022 12:37	0089_QC114_221212		✓		
EP2216902-008	12-Dec-2022 12:54	0089_MW120_221212	✓	✓	✓	✓
EP2216902-009	12-Dec-2022 13:06	0089_MW121_221212	✓	✓	✓	✓
EP2216902-010	12-Dec-2022 13:16	0089_MW500_221212	✓	✓	✓	✓
EP2216902-011	12-Dec-2022 13:25	0089_MW112_221212	✓	✓	✓	✓
EP2216902-012	12-Dec-2022 13:35	0089_MW109_221212	✓	✓	✓	✓
EP2216902-013	12-Dec-2022 13:52	0089_MW128_221212	✓	✓	✓	✓
EP2216902-014	12-Dec-2022 16:14	0089_QC301_221212		✓		
EP2216902-015	12-Dec-2022 16:14	0089_QC302_221212		✓		
EP2216902-016	12-Dec-2022 16:14	0089_QC303_221212		✓		
EP2216902-017	12-Dec-2022 16:15	0089_QC401_221212		✓		
EP2216902-018	12-Dec-2022 16:15	0089_QC402_221212		✓		
EP2216902-019	12-Dec-2022 16:16	0089_QC403_221212		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216902**	Page	: 1 of 16
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2022
C-O-C number	: 38219	Issue Date	: 30-Dec-2022 11:18
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 19		
No. of samples analysed	: 19		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits for sample #9 due to analytes not quantified in this report. Major cations (ED093F) and major anions (ED037/ED041G/ED045G) have been confirmed by re-analysis.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_221212	0089_MW141_221212	0089_QC101_221212	0089_MW142_221212	0089_MW149_221212
				Sampling date / time	12-Dec-2022 09:19	12-Dec-2022 09:37	12-Dec-2022 09:38	12-Dec-2022 10:19	12-Dec-2022 11:21
Compound	CAS Number	LOR	Unit		EP2216902-001	EP2216902-002	EP2216902-003	EP2216902-004	EP2216902-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		160	526	543	410	393
Total Alkalinity as CaCO3	----	1	mg/L		160	526	543	410	393
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		36	484	705	1190	1090
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		226	3880	6110	9020	6870
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		66	235	299	332	197
Magnesium	7439-95-4	1	mg/L		18	263	421	629	452
Sodium	7440-23-5	1	mg/L		106	1980	3190	4800	3390
Potassium	7440-09-7	1	mg/L		5	94	137	216	169
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		10.3	130	198	287	224
ø Total Cations	----	0.01	meq/L		9.51	122	192	283	199
ø Ionic Balance	----	0.01	%		4.07	3.23	1.55	0.84	6.03
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.33	0.38	0.12	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.94	1.05	0.25	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	15.0	17.5	4.86	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	1.42	1.54	0.15	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.01	129	140	2.86	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	0.2	0.2	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	0.76	0.79	0.33	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	5.86	6.04	2.95	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	0.30	0.33	0.10	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_221212	0089_MW141_221212	0089_QC101_221212	0089_MW142_221212	0089_MW149_221212
				Sampling date / time	12-Dec-2022 09:19	12-Dec-2022 09:37	12-Dec-2022 09:38	12-Dec-2022 10:19	12-Dec-2022 11:21
Compound	CAS Number	LOR	Unit		EP2216902-001	EP2216902-002	EP2216902-003	EP2216902-004	EP2216902-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.99**	**1.07**	**0.33**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.03**	**0.04**	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW139_221212	0089_MW141_221212	0089_QC101_221212	0089_MW142_221212	0089_MW149_221212
				Sampling date / time	12-Dec-2022 09:19	12-Dec-2022 09:37	12-Dec-2022 09:38	12-Dec-2022 10:19	12-Dec-2022 11:21
					EP2216902-001	EP2216902-002	EP2216902-003	EP2216902-004	EP2216902-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.01**	**155**	**169**	**12.0**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	**144**	**158**	**7.72**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	**152**	**166**	**11.6**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.1**	**62.4**	**64.6**	**85.6**	**90.9**
13C8-PFOA	----	0.02	%		**96.2**	**95.6**	**97.3**	**94.7**	**94.0**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW123_221212	0089_QC114_221212	0089_MW120_221212	0089_MW121_221212	0089_MW500_221212
				Sampling date / time	12-Dec-2022 12:36	12-Dec-2022 12:37	12-Dec-2022 12:54	12-Dec-2022 13:06	12-Dec-2022 13:16
					EP2216902-006	EP2216902-007	EP2216902-008	EP2216902-009	EP2216902-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	**10**	**11**	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**378**	----	**237**	**290**	**322**
Total Alkalinity as CaCO3	----	1	mg/L		**378**	----	**248**	**301**	**322**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**9**	----	**21**	**6**	**19**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**87**	----	**50**	**19**	**20**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**95**	----	**76**	**72**	**96**
Magnesium	7439-95-4	1	mg/L		**21**	----	**19**	**10**	**12**
Sodium	7440-23-5	1	mg/L		**81**	----	**34**	**11**	**18**
Potassium	7440-09-7	1	mg/L		**1**	----	**3**	**2**	<1
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**10.2**	----	**6.80**	**6.67**	**7.39**
ø Total Cations	----	0.01	meq/L		**10.0**	----	**6.91**	**4.94**	**6.56**
ø Ionic Balance	----	0.01	%		**0.87**	----	**0.80**	**14.9**	**5.96**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.08**	**0.09**	**0.02**	<0.02	**0.25**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	**0.06**	<0.02	**0.44**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.06**	**0.06**	**15.0**	**0.10**	**8.60**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	**2.95**	<0.02	**2.68**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.01**	**0.01**	**0.68**	**0.06**	**39.3**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	**0.1**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	**0.02**	**0.21**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.02**	**0.02**	**0.12**	**0.04**	**1.09**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.21**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_221212	0089_QC114_221212	0089_MW120_221212	0089_MW121_221212	0089_MW500_221212
				Sampling date / time	12-Dec-2022 12:36	12-Dec-2022 12:37	12-Dec-2022 12:54	12-Dec-2022 13:06	12-Dec-2022 13:16
Compound	CAS Number	LOR	Unit		EP2216902-006	EP2216902-007	EP2216902-008	EP2216902-009	EP2216902-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**1.60**	**0.02**	**0.78**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_221212	0089_QC114_221212	0089_MW120_221212	0089_MW121_221212	0089_MW500_221212
				Sampling date / time	12-Dec-2022 12:36	12-Dec-2022 12:37	12-Dec-2022 12:54	12-Dec-2022 13:06	12-Dec-2022 13:16
Compound	CAS Number	LOR	Unit		EP2216902-006	EP2216902-007	EP2216902-008	EP2216902-009	EP2216902-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.17**	**0.18**	**20.4**	**0.24**	**53.7**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.07**	**0.07**	**15.7**	**0.16**	**47.9**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.17**	**0.18**	**17.4**	**0.24**	**50.5**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.9**	**90.5**	**89.6**	**89.0**	**83.5**
13C8-PFOA	----	0.02	%		**95.6**	**94.4**	**99.2**	**94.6**	**102**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_221212	0089_MW109_221212	0089_MW128_221212	----	----
				Sampling date / time	12-Dec-2022 13:25	12-Dec-2022 13:35	12-Dec-2022 13:52	----	----
Compound	CAS Number	LOR	Unit		EP2216902-011	EP2216902-012	EP2216902-013	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		**6**	**10**	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**224**	**261**	**410**	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**230**	**271**	**410**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**9**	**22**	**35**	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**26**	**77**	**233**	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**74**	**83**	**112**	----	----
Magnesium	7439-95-4	1	mg/L		**8**	**15**	**50**	----	----
Sodium	7440-23-5	1	mg/L		**15**	**59**	**105**	----	----
Potassium	7440-09-7	1	mg/L		<1	<1	**13**	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**5.52**	**8.04**	**15.5**	----	----
ø Total Cations	----	0.01	meq/L		**5.00**	**7.94**	**14.6**	----	----
ø Ionic Balance	----	0.01	%		**4.87**	**0.64**	**2.96**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.06**	**0.08**	**0.05**	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.16**	**0.13**	**0.04**	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**6.72**	**0.62**	**0.33**	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.44**	<0.02	**0.09**	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**45.6**	**0.24**	**6.43**	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.1**	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.24**	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.84**	**0.07**	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.22**	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_221212	0089_MW109_221212	0089_MW128_221212	----	----
				Sampling date / time	12-Dec-2022 13:25	12-Dec-2022 13:35	12-Dec-2022 13:52	----	----
Compound	CAS Number	LOR	Unit		EP2216902-011	EP2216902-012	EP2216902-013	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.68**	**0.02**	**0.05**	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.03**	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		**0.65**	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_221212	0089_MW109_221212	0089_MW128_221212	----	----
				Sampling date / time	12-Dec-2022 13:25	12-Dec-2022 13:35	12-Dec-2022 13:52	----	----
Compound	CAS Number	LOR	Unit		EP2216902-011	EP2216902-012	EP2216902-013	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**55.7**	**1.16**	**6.99**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**52.3**	**0.86**	**6.76**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**54.5**	**1.03**	**6.86**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**86.7**	**91.2**	**84.9**	----	----
13C8-PFOA	----	0.02	%		**94.6**	**99.3**	**90.0**	----	----

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC301_221212	0089_QC302_221212	0089_QC303_221212	0089_QC401_221212	0089_QC402_221212
				Sampling date / time	12-Dec-2022 16:14	12-Dec-2022 16:14	12-Dec-2022 16:14	12-Dec-2022 16:15	12-Dec-2022 16:15
					EP2216902-014	EP2216902-015	EP2216902-016	EP2216902-017	EP2216902-018
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_221212	0089_QC302_221212	0089_QC303_221212	0089_QC401_221212	0089_QC402_221212
				Sampling date / time	12-Dec-2022 16:14	12-Dec-2022 16:14	12-Dec-2022 16:14	12-Dec-2022 16:15	12-Dec-2022 16:15
Compound	CAS Number	LOR	Unit		EP2216902-014	EP2216902-015	EP2216902-016	EP2216902-017	EP2216902-018
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.6**	**96.7**	**87.1**	**90.6**	**88.5**
13C8-PFOA	----	0.02	%		**98.4**	**94.0**	**93.9**	**91.6**	**92.1**

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	**0089_QC403_221212**	----	----	----	----
				Sampling date / time	12-Dec-2022 16:16	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2216902-019**	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_221212	----	----	----	----
				Sampling date / time	12-Dec-2022 16:16	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2216902-019	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**88.1**	----	----	----	----
13C8-PFOA	----	0.02	%		**91.0**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216902**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2022
C-O-C number	: 38219	Issue Date	: 30-Dec-2022
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 19		
No. of samples analysed	: 19		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4781471)									
EP2216879-016	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	308	310	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	308	310	0.6	0% - 20%
EP2216902-005	0089_MW149_221212	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	393	384	2.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	393	384	2.3	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791352)									
EP2216876-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	468	468	0.0	0% - 20%
EP2216876-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	117	114	3.1	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791355)									
EP2216902-005	0089_MW149_221212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1090	1100	0.9	0% - 20%
EP2216929-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	96	103	7.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791351)									
EP2216876-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	4060	4020	1.2	0% - 20%
EP2216876-011	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	822	815	0.8	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791354)									
EP2216902-005	0089_MW149_221212	ED045G: Chloride	16887-00-6	1	mg/L	6870	6780	1.4	0% - 20%
EP2216929-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	602	625	3.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4775585)									
EP2216873-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	508	503	1.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1570	1540	2.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4775585) - continued									
EP2216873-001	Anonymous	ED093F: Sodium	7440-23-5	1	mg/L	12600	12500	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	634	628	1.0	0% - 20%
EP2216873-013	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	466	469	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1460	0.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	11800	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	588	591	0.6	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4775586)									
EP2216902-008	0089_MW120_221212	ED093F: Calcium	7440-70-2	1	mg/L	76	77	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	19	19	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	34	35	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EP2217158-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	52	52	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	40	39	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	163	160	1.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	20	20	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4788774)									
EP2216879-021	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.08	0.06	25.5	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.60	0.50	17.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2216902-003	0089_QC101_221212	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	17.5	18.2	3.8	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	140	148	5.5	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.38	0.43	12.9	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	1.05	1.27	18.8	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	1.54	1.75	12.6	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4789075)									
EP2216902-013	0089_MW128_221212	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.33	0.28	15.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	6.43	5.62	13.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.09	0.07	28.4	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4788774)									
EP2216879-021	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4788774) - continued									
EP2216879-021	Anonymous	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2216902-003	0089_QC101_221212	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.07	1.22	13.2	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.79	0.86	9.3	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	6.04	6.95	14.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.33	0.37	10.3	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.04	0.05	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.2	0.2	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4789075)									
EP2216902-013	0089_MW128_221212	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.05	0.04	29.2	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.04	57.1	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4788774)									
EP2216879-021	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4788774) - continued									
EP2216879-021	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216902-003	0089_QC101_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4789075)									
EP2216902-013	0089_MW128_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4788774)									
EP2216879-021	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4788774) - continued									
EP2216879-021	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216902-003	0089_QC101_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4789075)									
EP2216902-013	0089_MW128_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4788774)									
EP2216879-021	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.68	0.56	19.4	0% - 20%
EP2216902-003	0089_QC101_221212	EP231X: Sum of PFAS	----	0.01	µg/L	169	179	5.9	0% - 20%
EP231P: PFAS Sums (QC Lot: 4789075)									
EP2216902-013	0089_MW128_221212	EP231X: Sum of PFAS	----	0.01	µg/L	6.99	6.13	13.1	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4781471)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	108	87.8	118
				<1	200 mg/L	95.3	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791352)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	93.6	89.9	112
				<1	500 mg/L	104	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791355)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.9	89.9	112
				<1	500 mg/L	92.6	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791351)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	88.6	113
				<1	1000 mg/L	105	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 4791354)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	91.0	88.6	113
				<1	1000 mg/L	109	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4775585)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.7	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4775586)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.9	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4788774)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	79.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	105	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	91.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	96.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	81.8	65.0	140

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4788774) - continued								
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	102	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789075)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	73.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	86.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	82.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	81.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	76.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	69.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4788774)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	85.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	81.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	98.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	91.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	123	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789075)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	77.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	83.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	87.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	92.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788774)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	82.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	76.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	88.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	99.6	66.0	145

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788774) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	83.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	83.0	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789075)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	79.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	77.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	71.4	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	78.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	80.6	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	85.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	75.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4788774)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	105	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	78.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	97.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	76.0	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789075)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	88.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	76.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	70.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	78.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791352)							
EP2216876-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791355)							
EP2216902-005	0089_MW149_221212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791351)							
EP2216876-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791354)							
EP2216902-005	0089_MW149_221212	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4788774)							
EP2216902-006	0089_MW123_221212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	86.0	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	110	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	96.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	107	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	91.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	111	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789075)							
EP2216932-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	82.0	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	94.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	85.0	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	88.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	76.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	76.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4788774)							
EP2216902-006	0089_MW123_221212	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	94.9	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	107	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	100	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	87.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	104	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	110	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	96.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	124	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	115	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	126	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789075)							
EP2216932-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	81.7	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	93.6	72.0	129

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789075) - continued							
EP2216932-001	Anonymous	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	83.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	93.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	88.2	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	90.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	90.2	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	97.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	130	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	109	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788774)							
EP2216902-006	0089_MW123_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	95.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	93.2	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	89.5	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	116	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	121	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	87.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789075)							
EP2216932-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	89.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	106	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	83.6	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	91.0	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	87.9	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	94.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	80.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4788774)							
EP2216902-006	0089_MW123_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	81.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	102	67.0	138

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4788774) - continued							
EP2216902-006	0089_MW123_221212	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	74.8	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789075)							
EP2216932-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	98.8	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	97.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	81.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	73.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216902**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling GW - MB	Issue Date	: 30-Dec-2022
Sampler	: [redacted]	No. of samples received	: 19
Order number	: pfas-omp/Stirling	No. of samples analysed	: 19

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216876--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216902--005	0089_MW149_221212	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216876--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216902--005	0089_MW149_221212	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_MW139_221212,	0089_MW141_221212,	----	----	----	20-Dec-2022	19-Dec-2022	**1**
0089_QC101_221212,	0089_MW142_221212,						
0089_MW149_221212,	0089_MW123_221212,						
0089_MW120_221212,	0089_MW121_221212,						
0089_MW500_221212,	0089_MW112_221212,						
0089_MW109_221212,	0089_MW128_221212						

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	3	39	7.69	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW139_221212, 0089_MW141_221212, 0089_QC101_221212, 0089_MW142_221212, 0089_MW149_221212, 0089_MW123_221212, 0089_MW120_221212, 0089_MW121_221212, 0089_MW500_221212, 0089_MW112_221212, 0089_MW109_221212, 0089_MW128_221212	**12-Dec-2022**	**----**	----	----	**20-Dec-2022**	26-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW149_221212, 0089_MW123_221212, 0089_MW120_221212, 0089_MW121_221212, 0089_MW500_221212, 0089_MW112_221212, 0089_MW109_221212, 0089_MW128_221212	**12-Dec-2022**	**----**	----	----	**28-Dec-2022**	09-Jan-2023	✓
Clear Plastic Bottle - Natural (ED041G)							
0089_MW139_221212, 0089_MW141_221212, 0089_QC101_221212, 0089_MW142_221212	**12-Dec-2022**	**----**	----	----	**29-Dec-2022**	09-Jan-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW149_221212, 0089_MW123_221212, 0089_MW120_221212, 0089_MW121_221212, 0089_MW500_221212, 0089_MW112_221212, 0089_MW109_221212, 0089_MW128_221212	**12-Dec-2022**	**----**	----	----	**28-Dec-2022**	09-Jan-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
0089_MW139_221212, 0089_MW141_221212, 0089_QC101_221212, 0089_MW142_221212	**12-Dec-2022**	**----**	----	----	**29-Dec-2022**	09-Jan-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW139_221212, 0089_MW141_221212, 0089_QC101_221212, 0089_MW142_221212, 0089_MW149_221212, 0089_MW123_221212, 0089_MW120_221212, 0089_MW121_221212, 0089_MW500_221212, 0089_MW112_221212, 0089_MW109_221212, 0089_MW128_221212	**12-Dec-2022**	**----**	----	----	**20-Dec-2022**	19-Dec-2022	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_221212, 0089_MW141_221212, 0089_QC101_221212, 0089_MW142_221212, 0089_MW149_221212, 0089_MW123_221212, 0089_QC114_221212, 0089_MW120_221212, 0089_MW121_221212, 0089_MW500_221212, 0089_MW112_221212, 0089_MW109_221212, 0089_MW128_221212, 0089_QC301_221212, 0089_QC302_221212, 0089_QC303_221212, 0089_QC401_221212, 0089_QC402_221212, 0089_QC403_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_221212, 0089_MW141_221212, 0089_QC101_221212, 0089_MW142_221212, 0089_MW149_221212, 0089_MW123_221212, 0089_QC114_221212, 0089_MW120_221212, 0089_MW121_221212, 0089_MW500_221212, 0089_MW112_221212, 0089_MW109_221212, 0089_MW128_221212, 0089_QC301_221212, 0089_QC302_221212, 0089_QC303_221212, 0089_QC401_221212, 0089_QC402_221212, 0089_QC403_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW139_221212, 0089_MW141_221212, 0089_QC101_221212, 0089_MW142_221212, 0089_MW149_221212, 0089_MW123_221212, 0089_QC114_221212, 0089_MW120_221212, 0089_MW121_221212, 0089_MW500_221212, 0089_MW112_221212, 0089_MW109_221212, 0089_MW128_221212, 0089_QC301_221212, 0089_QC302_221212, 0089_QC303_221212, 0089_QC401_221212, 0089_QC402_221212, 0089_QC403_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_221212, 0089_MW141_221212, 0089_QC101_221212, 0089_MW142_221212, 0089_MW149_221212, 0089_MW123_221212, 0089_QC114_221212, 0089_MW120_221212, 0089_MW121_221212, 0089_MW500_221212, 0089_MW112_221212, 0089_MW109_221212, 0089_MW128_221212, 0089_QC301_221212, 0089_QC302_221212, 0089_QC303_221212, 0089_QC401_221212, 0089_QC402_221212, 0089_QC403_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW139_221212, 0089_MW141_221212, 0089_QC101_221212, 0089_MW142_221212, 0089_MW149_221212, 0089_MW123_221212, 0089_QC114_221212, 0089_MW120_221212, 0089_MW121_221212, 0089_MW500_221212, 0089_MW112_221212, 0089_MW109_221212, 0089_MW128_221212, 0089_QC301_221212, 0089_QC302_221212, 0089_QC303_221212, 0089_QC401_221212, 0089_QC402_221212, 0089_QC403_221212	**12-Dec-2022**	**23-Dec-2022**	10-Jun-2023	✓	**29-Dec-2022**	10-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	39	**7.69**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2216929

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP **Client:** Stantec Australia **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: **# Samples:** **Sampler:**

Phone:

46321; 46329; 46330; 46304; 46303; 46320; 46344; 46302

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 13/12/22 ~ 2:30pm	Date / Time: 13/12 17:00	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) *COC#:* 46302 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW196		13/12/2022 08:51 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_MW216		13/12/2022 10:10 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_MW214		13/12/2022 10:21 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_MW215		13/12/2022 10:34 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_MW225		13/12/2022 10:51 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_MW228		13/12/2022 12:55 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 46302 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW196	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW216	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW214	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW215	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW225	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW228	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 46302 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW196	Clear Plastic Bottle - Natural	500 mL	00070522163703	Green	No	
001	0089_MW196	HDPE (no PTFE)	20 mL	00350522062476	Grey	No	
001	0089_MW196	HDPE (no PTFE)	20 mL	00350522042698	Grey	No	
002	0089_MW216	Clear Plastic Bottle - Natural	500 mL	00070522163816	Green	No	
002	0089_MW216	HDPE (no PTFE)	20 mL	00350522042982	Grey	No	
002	0089_MW216	HDPE (no PTFE)	20 mL	00350522043186	Grey	No	
003	0089_MW214	Clear Plastic Bottle - Natural	500 mL	00070522163697	Green	No	
003	0089_MW214	HDPE (no PTFE)	20 mL	00350522042946	Grey	No	
003	0089_MW214	HDPE (no PTFE)	20 mL	00350522062460	Grey	No	
004	0089_MW215	HDPE (no PTFE)	20 mL	00350522042775	Grey	No	
004	0089_MW215	Clear Plastic Bottle - Natural	500 mL	00070522146727	Green	No	
004	0089_MW215	HDPE (no PTFE)	20 mL	00350522042985	Grey	No	
005	0089_MW225	Clear Plastic Bottle - Natural	500 mL	00070522163734	Green	No	
005	0089_MW225	HDPE (no PTFE)	20 mL	00350522062443	Grey	No	
005	0089_MW225	HDPE (no PTFE)	20 mL	00350522062412	Grey	No	
006	0089_MW228	Clear Plastic Bottle - Natural	500 mL	00070522163790	Green	No	
006	0089_MW228	HDPE (no PTFE)	20 mL	00350522042984	Grey	No	
006	0089_MW228	HDPE (no PTFE)	20 mL	00350522042938	Grey	No	

Total Bottle Count: ALS: 18, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216929**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46302	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 20-Dec-2022 17:00	Issue Date	: 19-Dec-2022
Client Requested Due Date	: 30-Dec-2022	Scheduled Reporting Date	: **30-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 18.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2216929-001	13-Dec-2022 08:51	0089_MW196_221213	✓	✓	✓	✓
EP2216929-002	13-Dec-2022 10:10	0089_MW216_221213	✓	✓	✓	✓
EP2216929-003	13-Dec-2022 10:21	0089_MW214_221213	✓	✓	✓	✓
EP2216929-004	13-Dec-2022 10:34	0089_MW215_221213	✓	✓	✓	✓
EP2216929-005	13-Dec-2022 10:51	0089_MW225_221213	✓	✓	✓	✓
EP2216929-006	13-Dec-2022 12:55	0089_MW228_221213	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216929**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 20-Dec-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Dec-2022
C-O-C number	: 46302	Issue Date	: 29-Dec-2022 14:42
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW196_221213	0089_MW216_221213	0089_MW214_221213	0089_MW215_221213	0089_MW225_221213
				Sampling date / time	13-Dec-2022 08:51	13-Dec-2022 10:10	13-Dec-2022 10:21	13-Dec-2022 10:34	13-Dec-2022 10:51
					EP2216929-001	EP2216929-002	EP2216929-003	EP2216929-004	EP2216929-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**225**	**264**	**424**	**304**	**343**
Total Alkalinity as CaCO3	----	1	mg/L		**225**	**264**	**424**	**304**	**343**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**21**	**192**	**96**	**32**	**46**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**33**	**898**	**602**	**398**	**405**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**68**	**218**	**218**	**119**	**125**
Magnesium	7439-95-4	1	mg/L		**19**	**66**	**44**	**27**	**40**
Sodium	7440-23-5	1	mg/L		**24**	**437**	**277**	**194**	**198**
Potassium	7440-09-7	1	mg/L		**2**	**10**	**7**	**3**	**5**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**5.86**	**34.6**	**27.4**	**18.0**	**19.2**
ø Total Cations	----	0.01	meq/L		**6.05**	**35.6**	**26.7**	**16.7**	**18.3**
ø Ionic Balance	----	0.01	%		**1.58**	**1.38**	**1.34**	**3.73**	**2.57**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.46**	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.57**	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**4.02**	<0.01	**0.24**	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.14**	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.96**	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**8.3**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**27.3**	<0.02	**0.04**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**15.0**	<0.02	**0.06**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.51**	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW196_221213	0089_MW216_221213	0089_MW214_221213	0089_MW215_221213	0089_MW225_221213
				Sampling date / time	13-Dec-2022 08:51	13-Dec-2022 10:10	13-Dec-2022 10:21	13-Dec-2022 10:34	13-Dec-2022 10:51
Compound	CAS Number	LOR	Unit		EP2216929-001	EP2216929-002	EP2216929-003	EP2216929-004	EP2216929-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.32**	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	**1.92**	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW196_221213	0089_MW216_221213	0089_MW214_221213	0089_MW215_221213	0089_MW225_221213
				Sampling date / time	13-Dec-2022 08:51	13-Dec-2022 10:10	13-Dec-2022 10:21	13-Dec-2022 10:34	13-Dec-2022 10:51
Compound	CAS Number	LOR	Unit		EP2216929-001	EP2216929-002	EP2216929-003	EP2216929-004	EP2216929-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**59.5**	<0.01	**0.34**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**4.98**	<0.01	**0.24**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**58.8**	<0.01	**0.34**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**93.2**	**101**	**97.0**	**97.1**
13C8-PFOA	----	0.02	%		**102**	**102**	**100**	**104**	**105**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_221213	----	----	----	----
				Sampling date / time	13-Dec-2022 12:55	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2216929-006	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**659**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**659**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**525**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**3460**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**127**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**305**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**1910**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**107**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**122**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**117**	----	----	----	----
ø Ionic Balance	----	0.01	%		**1.86**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.17**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.10**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.23**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**1.0**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**3.96**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**3.87**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**1.05**	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_221213	----	----	----	----
				Sampling date / time	13-Dec-2022 12:55	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2216929-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.19**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.66**	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_221213	----	----	----	----
				Sampling date / time	13-Dec-2022 12:55	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2216929-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**11.2**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.23**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**11.1**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.2**	----	----	----	----
13C8-PFOA	----	0.02	%		**104**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216929**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 20-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Dec-2022
C-O-C number	: 46302	Issue Date	: 29-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4787472)									
EP2216929-001	0089_MW196_221213	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	225	227	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	225	227	1.1	0% - 20%
EP2216930-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	121	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	121	1.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791355)									
EP2216902-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1090	1100	0.9	0% - 20%
EP2216929-003	0089_MW214_221213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	96	103	7.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791354)									
EP2216902-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	6870	6780	1.4	0% - 20%
EP2216929-003	0089_MW214_221213	ED045G: Chloride	16887-00-6	1	mg/L	602	625	3.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4781669)									
EP2216929-001	0089_MW196_221213	ED093F: Calcium	7440-70-2	1	mg/L	68	70	2.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	19	20	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	24	24	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EP2216932-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	65	65	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	10	10	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	11	10	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4781786)									
EP2216929-006	0089_MW228_221213	ED093F: Calcium	7440-70-2	1	mg/L	127	127	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	305	304	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1910	1900	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	107	107	0.0	0% - 20%
EP2217224-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2890	3030	4.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1210	1270	4.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	12200	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	413	432	4.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4790775)									
EP2216973-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.01	0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4790775)									
EP2216973-005	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4790775)									
EP2216973-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4790775) - continued									
EP2216973-005	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4790775)									
EP2216973-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4790775)									
EP2216973-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.01	0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4787472)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	100	87.8	118
				<1	200 mg/L	93.3	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791355)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.9	89.9	112
				<1	500 mg/L	92.6	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791354)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	91.0	88.6	113
				<1	1000 mg/L	109	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4781669)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4781786)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	108	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790775)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	94.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	106	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	101	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790775)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	110	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	99.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790775) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	120	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	114	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	91.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	77.3	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790775)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	106	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	102	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	113	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	123	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	99.5	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	107	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	87.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4790775)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	106	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	105	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	85.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791355)							
EP2216902-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791354)							
EP2216902-005	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790775)							
EP2216973-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	104	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	115	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	105	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	120	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	113	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	103	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790775)							
EP2216973-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	116	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	112	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	114	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	117	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	120	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	106	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	122	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	102	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	107	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	89.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	89.5	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790775)							
EP2216973-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	117	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	114	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	118	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	121	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	111	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	110	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	94.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4790775)							
EP2216973-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	103	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	115	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	108	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	106	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216929**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 20-Dec-2022
Site	: Stirling GW - CG	Issue Date	: 29-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216902--005	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216902--005	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Due for extraction	Days overdue	Analysis: Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural 0089_MW196_221213, 0089_MW216_221213, 0089_MW214_221213, 0089_MW215_221213, 0089_MW225_221213	----	----	----	21-Dec-2022	20-Dec-2022	**1**
Clear Plastic Bottle - Natural 0089_MW228_221213	----	----	----	28-Dec-2022	20-Dec-2022	**8**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	17	5.88	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Due for extraction	Evaluation	Analysis: Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW196_221213, 0089_MW214_221213, 0089_MW225_221213, 0089_MW216_221213, 0089_MW215_221213, 0089_MW228_221213	**13-Dec-2022**	**----**	----	----	**22-Dec-2022**	27-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW196_221213, 0089_MW214_221213, 0089_MW225_221213, 0089_MW216_221213, 0089_MW215_221213, 0089_MW228_221213	**13-Dec-2022**	**----**	----	----	**28-Dec-2022**	10-Jan-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW196_221213, 0089_MW214_221213, 0089_MW225_221213, 0089_MW216_221213, 0089_MW215_221213, 0089_MW228_221213	**13-Dec-2022**	**----**	----	----	**28-Dec-2022**	10-Jan-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW196_221213, 0089_MW214_221213, 0089_MW225_221213, 0089_MW216_221213, 0089_MW215_221213,	**13-Dec-2022**	**----**	----	----	**21-Dec-2022**	20-Dec-2022	×
Clear Plastic Bottle - Natural (ED093F)							
0089_MW228_221213	**13-Dec-2022**	**----**	----	----	**28-Dec-2022**	20-Dec-2022	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW196_221213, 0089_MW214_221213, 0089_MW225_221213, 0089_MW216_221213, 0089_MW215_221213, 0089_MW228_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW196_221213, 0089_MW214_221213, 0089_MW225_221213, 0089_MW216_221213, 0089_MW215_221213, 0089_MW228_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW196_221213, 0089_MW214_221213, 0089_MW225_221213, 0089_MW216_221213, 0089_MW215_221213, 0089_MW228_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW196_221213, 0089_MW214_221213, 0089_MW225_221213, 0089_MW216_221213, 0089_MW215_221213, 0089_MW228_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW196_221213, 0089_MW216_221213, 0089_MW214_221213, 0089_MW215_221213, 0089_MW225_221213, 0089_MW228_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2216930

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP **Client:** Stantec Australia **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: **# Samples:** **Sampler:**

Phone:

46321; 46329; 46330; 46304; 46303; 46320; 46344; 46302

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 13/12/22 ~ 2:30pm	Date / Time: 13/12 17:00	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 46303 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW369		13/12/2022 09:19 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_PW367		13/12/2022 09:23 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_PW345		13/12/2022 09:24 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_SW311		13/12/2022 11:41 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_SW310		13/12/2022 11:42 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_PW405		13/12/2022 01:22 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW407		13/12/2022 01:23 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: 46303 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW369	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW367	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW345	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW311	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_SW310	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW405	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW407	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

Tuesday, December 13, 2022 8:02:54 AM

CHAIN OF CUSTODY

ALS COC#: 46303 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free Ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW369	Clear Plastic Bottle - Natural	500 mL	00070522143328	Green	No	
001	0089_PW369	HDPE (no PTFE)	20 mL	00350522042987	Grey	No	
001	0089_PW369	HDPE (no PTFE)	20 mL	00350522043171	Grey	No	
002	0089_PW367	Clear Plastic Bottle - Natural	500 mL	00070522163803	Green	No	
002	0089_PW367	HDPE (no PTFE)	20 mL	00350522042757	Grey	No	
002	0089_PW367	HDPE (no PTFE)	20 mL	00350522042849	Grey	No	
003	0089_PW345	Clear Plastic Bottle - Natural	500 mL	00070522146725	Green	No	
003	0089_PW345	HDPE (no PTFE)	20 mL	00350522062437	Grey	No	
003	0089_PW345	HDPE (no PTFE)	20 mL	00350522042758	Grey	No	
004	0089_SW311	Clear Plastic Bottle - Natural	500 mL	00070522143376	Green	No	
004	0089_SW311	HDPE (no PTFE)	20 mL	00350522043178	Grey	No	
004	0089_SW311	HDPE (no PTFE)	20 mL	00350522043153	Grey	No	
005	0089_SW310	Clear Plastic Bottle - Natural	500 mL	00070522146738	Green	No	
005	0089_SW310	HDPE (no PTFE)	20 mL	00350522043169	Grey	No	
005	0089_SW310	HDPE (no PTFE)	20 mL	00350522043110	Grey	No	
006	0089_PW405	Clear Plastic Bottle - Natural	500 mL	00070522146719	Green	No	
006	0089_PW405	HDPE (no PTFE)	20 mL	00350522043200	Grey	No	
006	0089_PW405	HDPE (no PTFE)	20 mL	00350522043125	Grey	No	
007	0089_PW407	Clear Plastic Bottle - Natural	500 mL	00070522143327	Green	No	
007	0089_PW407	HDPE (no PTFE)	20 mL	00350522043021	Grey	No	
007	0089_PW407	HDPE (no PTFE)	20 mL	00350522043179	Grey	No	

Total Bottle Count: ALS: 21, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216930**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46303	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 17:00	Issue Date	: 19-Dec-2022
Client Requested Due Date	: 30-Dec-2022	Scheduled Reporting Date	: **30-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 18.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2216930-001	13-Dec-2022 09:19	0089_PW369_221213	✓	✓	✓	✓
EP2216930-002	13-Dec-2022 09:23	0089_PW367_221213	✓	✓	✓	✓
EP2216930-003	13-Dec-2022 09:24	0089_PW345_221213	✓	✓	✓	✓
EP2216930-004	13-Dec-2022 11:41	0089_SW311_221213	✓	✓	✓	✓
EP2216930-005	13-Dec-2022 11:42	0089_SW310_221213	✓	✓	✓	✓
EP2216930-006	13-Dec-2022 13:22	0089_PW405_221213	✓	✓	✓	✓
EP2216930-007	13-Dec-2022 13:23	0089_PW407_221213	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216930**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Dec-2022
C-O-C number	: 46303	Issue Date	: 30-Dec-2022 14:53
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW369_221213	0089_PW367_221213	0089_PW345_221213	0089_SW311_221213	0089_SW310_221213
				Sampling date / time	13-Dec-2022 09:19	13-Dec-2022 09:23	13-Dec-2022 09:24	13-Dec-2022 11:41	13-Dec-2022 11:42
Compound	CAS Number	LOR	Unit		EP2216930-001	EP2216930-002	EP2216930-003	EP2216930-004	EP2216930-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**330**	**470**	**286**	**118**	**120**
Total Alkalinity as CaCO3	----	1	mg/L		**330**	**470**	**286**	**118**	**120**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2250**	**1650**	**2020**	**2600**	**2560**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17900**	**12300**	**15700**	**20200**	**20200**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**418**	**305**	**367**	**428**	**455**
Magnesium	7439-95-4	1	mg/L		**1230**	**828**	**1040**	**1370**	**1450**
Sodium	7440-23-5	1	mg/L		**9780**	**6270**	**8340**	**11200**	**11700**
Potassium	7440-09-7	1	mg/L		**489**	**309**	**411**	**556**	**586**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**558**	**391**	**491**	**626**	**626**
ø Total Cations	----	0.01	meq/L		**560**	**364**	**477**	**636**	**666**
ø Ionic Balance	----	0.01	%		**0.14**	**3.54**	**1.39**	**0.73**	**3.13**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.03**	**0.02**	**0.07**	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW369_221213	0089_PW367_221213	0089_PW345_221213	0089_SW311_221213	0089_SW310_221213
				Sampling date / time	13-Dec-2022 09:19	13-Dec-2022 09:23	13-Dec-2022 09:24	13-Dec-2022 11:41	13-Dec-2022 11:42
Compound	CAS Number	LOR	Unit		EP2216930-001	EP2216930-002	EP2216930-003	EP2216930-004	EP2216930-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW369_221213	0089_PW367_221213	0089_PW345_221213	0089_SW311_221213	0089_SW310_221213
				Sampling date / time	13-Dec-2022 09:19	13-Dec-2022 09:23	13-Dec-2022 09:24	13-Dec-2022 11:41	13-Dec-2022 11:42
Compound	CAS Number	LOR	Unit		EP2216930-001	EP2216930-002	EP2216930-003	EP2216930-004	EP2216930-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.03**	**0.02**	**0.07**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.03**	**0.02**	**0.07**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	**0.02**	**0.07**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.0**	**91.3**	**97.0**	**99.8**	**87.8**
13C8-PFOA	----	0.02	%		**97.1**	**89.0**	**94.7**	**102**	**89.3**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW405_221213	0089_PW407_221213	----	----	----
			Sampling date / time	13-Dec-2022 13:22	13-Dec-2022 13:23	----	----	----
Compound	CAS Number	LOR	Unit	EP2216930-006	EP2216930-007	--------	--------	--------
				Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	155	194	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	155	194	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2650	2870	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	20900	19000	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	486	496	----	----	----
Magnesium	7439-95-4	1	mg/L	1490	1550	----	----	----
Sodium	7440-23-5	1	mg/L	12000	12300	----	----	----
Potassium	7440-09-7	1	mg/L	610	624	----	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	648	600	----	----	----
ø Total Cations	----	0.01	meq/L	684	703	----	----	----
ø Ionic Balance	----	0.01	%	2.75	7.96	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW405_221213	0089_PW407_221213	----	----	----
				Sampling date / time	13-Dec-2022 13:22	13-Dec-2022 13:23	----	----	----
Compound	CAS Number	LOR	Unit		EP2216930-006	EP2216930-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW405_221213	0089_PW407_221213	----	----	----
			Sampling date / time	13-Dec-2022 13:22	13-Dec-2022 13:23	----	----	----
Compound	CAS Number	LOR	Unit	EP2216930-006	EP2216930-007	--------	--------	--------
				Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	----	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**91.3**	**88.8**	----	----	----
13C8-PFOA	----	0.02	%	**88.9**	**88.8**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216930**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Dec-2022
C-O-C number	: 46303	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4787472)									
EP2216929-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	225	227	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	225	227	1.1	0% - 20%
EP2216930-005	0089_SW310_221213	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	121	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	121	1.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791355)									
EP2216902-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1090	1100	0.9	0% - 20%
EP2216929-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	96	103	7.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791357)									
EP2216930-007	0089_PW407_221213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2870	2880	0.0	0% - 20%
EP2216932-010	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	8	8	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4791354)									
EP2216902-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	6870	6780	1.4	0% - 20%
EP2216929-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	602	625	3.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791356)									
EP2216930-007	0089_PW407_221213	ED045G: Chloride	16887-00-6	1	mg/L	19000	19400	1.7	0% - 20%
EP2216932-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	24	24	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4781669)									
EP2216929-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	68	70	2.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	19	20	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4781669) - continued									
EP2216929-001	Anonymous	ED093F: Sodium	7440-23-5	1	mg/L	24	24	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EP2216932-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	65	65	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	10	10	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	11	10	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4781786)									
EP2216929-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	127	127	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	305	304	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1910	1900	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	107	107	0.0	0% - 20%
EP2217224-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2890	3030	4.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1210	1270	4.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	12200	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	413	432	4.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4789075)									
EP2216902-013	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.33	0.28	15.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	6.43	5.62	13.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.09	0.07	28.4	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4789075)									
EP2216902-013	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.05	0.04	29.2	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.04	57.1	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4789075)									
EP2216902-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4789075) - continued									
EP2216902-013	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4789075)									
EP2216902-013	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4789075)									
EP2216902-013	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	6.99	6.13	13.1	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4787472)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	100	87.8	118
				<1	200 mg/L	93.3	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791355)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.9	89.9	112
				<1	500 mg/L	92.6	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791357)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	89.9	112
				<1	500 mg/L	99.6	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791354)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	91.0	88.6	113
				<1	1000 mg/L	109	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 4791356)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	94.5	88.6	113
				<1	1000 mg/L	93.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4781669)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4781786)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	108	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789075)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	73.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	86.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	82.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	81.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	76.4	65.0	140

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789075) - continued								
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	69.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789075)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	77.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	83.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	87.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	92.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789075)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	79.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	77.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	71.4	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	78.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	80.6	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	85.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	75.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789075)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	88.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	76.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	70.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	78.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791355)							
EP2216902-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791357)							
EP2216930-007	0089_PW407_221213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791354)							
EP2216902-005	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791356)							
EP2216930-007	0089_PW407_221213	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789075)							
EP2216932-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	82.0	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	94.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	85.0	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	88.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	76.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	76.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789075)							
EP2216932-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	81.7	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	93.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	83.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	93.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	88.2	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	90.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	90.2	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	97.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	130	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	109	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789075)							
EP2216932-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	89.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	106	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	83.6	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	91.0	66.0	145

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789075) - continued							
EP2216932-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	87.9	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	94.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	80.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789075)							
EP2216932-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	98.8	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	97.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	81.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	73.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216930**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling SW/PW - CG	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216902--005	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216930--007	0089_PW407_221213	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216902--005	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216930--007	0089_PW407_221213	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_PW369_221213, 0089_PW345_221213, 0089_SW310_221213	0089_PW367_221213, 0089_SW311_221213,	----	----	----	21-Dec-2022	20-Dec-2022	**1**
Clear Plastic Bottle - Natural							
0089_PW405_221213,	0089_PW407_221213	----	----	----	28-Dec-2022	20-Dec-2022	**8**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	20	5.00	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW369_221213, 0089_PW367_221213, 0089_PW345_221213, 0089_SW311_221213, 0089_SW310_221213, 0089_PW405_221213, 0089_PW407_221213	**13-Dec-2022**	**----**	----	----	**22-Dec-2022**	27-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW369_221213, 0089_PW367_221213, 0089_PW345_221213, 0089_SW311_221213, 0089_SW310_221213, 0089_PW405_221213	**13-Dec-2022**	**----**	----	----	**28-Dec-2022**	10-Jan-2023	✓
Clear Plastic Bottle - Natural (ED041G)							
0089_PW407_221213	**13-Dec-2022**	**----**	----	----	**30-Dec-2022**	10-Jan-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW369_221213, 0089_PW367_221213, 0089_PW345_221213, 0089_SW311_221213, 0089_SW310_221213, 0089_PW405_221213	**13-Dec-2022**	**----**	----	----	**28-Dec-2022**	10-Jan-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
0089_PW407_221213	**13-Dec-2022**	**----**	----	----	**30-Dec-2022**	10-Jan-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW369_221213, 0089_PW367_221213, 0089_PW345_221213, 0089_SW311_221213, 0089_SW310_221213	**13-Dec-2022**	**----**	----	----	**21-Dec-2022**	20-Dec-2022	×
Clear Plastic Bottle - Natural (ED093F)							
0089_PW405_221213, 0089_PW407_221213	**13-Dec-2022**	**----**	----	----	**28-Dec-2022**	20-Dec-2022	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW369_221213, 0089_PW367_221213, 0089_PW345_221213, 0089_SW311_221213, 0089_SW310_221213, 0089_PW405_221213, 0089_PW407_221213	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW369_221213, 0089_PW367_221213, 0089_PW345_221213, 0089_SW311_221213, 0089_SW310_221213, 0089_PW405_221213, 0089_PW407_221213	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW369_221213, 0089_PW367_221213, 0089_PW345_221213, 0089_SW311_221213, 0089_SW310_221213, 0089_PW405_221213, 0089_PW407_221213	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW369_221213, 0089_PW367_221213, 0089_PW345_221213, 0089_SW311_221213, 0089_SW310_221213, 0089_PW405_221213, 0089_PW407_221213	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW369_221213, 0089_PW367_221213, 0089_PW345_221213, 0089_SW311_221213, 0089_SW310_221213, 0089_PW405_221213, 0089_PW407_221213	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2216931

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP **Client:** Stantec Australia **Project Manager:** [redacted]

Phone: (

ALS Compass COC Reference: **# Samples:** **Sampler:**

Phone: (

46321; 46329; 46330; 46304; 46303; 46320; 46364; 46302

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 13/12/22 ~ 2:00pm	Date / Time: 13/12 17:00	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) COC#: 46304 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD367		13/12/2022 09:24 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD345		13/12/2022 09:25 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD369		13/12/2022 09:25 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD307		13/12/2022 11:16 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD315		13/12/2022 11:16 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD306		13/12/2022 11:16 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD314		13/12/2022 11:17 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
008	0089_SD308		13/12/2022 11:17 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
009	0089_SD316		13/12/2022 11:18 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 46304 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SD407		13/12/2022 01:06 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 46304 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD367	HDPE Soil Jar	200 mL	00620322095470	Grey	No	
002	0089_SD345	HDPE Soil Jar	200 mL	00620322095488	Grey	No	
003	0089_SD369	HDPE Soil Jar	200 mL	00620322095475	Grey	No	
004	0089_SD307	HDPE Soil Jar	200 mL	00620322095615	Grey	No	
005	0089_SD315	HDPE Soil Jar	200 mL	00620322095473	Grey	No	
006	0089_SD306	HDPE Soil Jar	200 mL	00620322095539	Grey	No	
007	0089_SD314	HDPE Soil Jar	200 mL	00620322095478	Grey	No	
008	0089_SD308	HDPE Soil Jar	200 mL	00620322095518	Grey	No	
009	0089_SD316	HDPE Soil Jar	200 mL	00620322095502	Grey	No	
010	0089_SD407	HDPE Soil Jar	200 mL	00620322054428	Grey	No	

Total Bottle Count: ALS: 10, Non ALS: 0

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216931**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46304	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 17:00	Issue Date	: 19-Dec-2022
Client Requested Due Date	: 30-Dec-2022	Scheduled Reporting Date	: **30-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 18.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2216931-001	13-Dec-2022 09:24	0089_SD367_221212	✓	✓
EP2216931-002	13-Dec-2022 09:25	0089_SD345_221212	✓	✓
EP2216931-003	13-Dec-2022 09:25	0089_SD369_221212	✓	✓
EP2216931-004	13-Dec-2022 11:16	0089_SD307_221212	✓	✓
EP2216931-005	13-Dec-2022 11:16	0089_SD315_221212	✓	✓
EP2216931-006	13-Dec-2022 11:16	0089_SD306_221212	✓	✓
EP2216931-007	13-Dec-2022 11:17	0089_SD314_221212	✓	✓
EP2216931-008	13-Dec-2022 11:17	0089_SD308_221212	✓	✓
EP2216931-009	13-Dec-2022 11:18	0089_SD316_221212	✓	✓
EP2216931-010	13-Dec-2022 13:06	0089_SD407_221212	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216931**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 22-Dec-2022
C-O-C number	: 46304	Issue Date	: 30-Dec-2022 08:58
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD367_221212	0089_SD345_221212	0089_SD369_221212	0089_SD307_221212	0089_SD315_221212
				Sampling date / time	13-Dec-2022 09:24	13-Dec-2022 09:25	13-Dec-2022 09:25	13-Dec-2022 11:16	13-Dec-2022 11:16
					EP2216931-001	EP2216931-002	EP2216931-003	EP2216931-004	EP2216931-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**36.4**	**35.7**	**36.5**	**22.6**	**6.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0004**	**0.0003**	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD367_221212	0089_SD345_221212	0089_SD369_221212	0089_SD307_221212	0089_SD315_221212
				Sampling date / time	13-Dec-2022 09:24	13-Dec-2022 09:25	13-Dec-2022 09:25	13-Dec-2022 11:16	13-Dec-2022 11:16
Compound	CAS Number	LOR	Unit		EP2216931-001	EP2216931-002	EP2216931-003	EP2216931-004	EP2216931-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0004**	**0.0003**	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0004**	**0.0003**	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0004**	**0.0003**	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**98.5**	**98.5**	**97.5**	**102**	**112**
13C8-PFOA	----	0.0002	%		**102**	**100**	**102**	**96.5**	**100**

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD306_221212	0089_SD314_221212	0089_SD308_221212	0089_SD316_221212	0089_SD407_221212
				Sampling date / time	13-Dec-2022 11:16	13-Dec-2022 11:17	13-Dec-2022 11:17	13-Dec-2022 11:18	13-Dec-2022 13:06
					EP2216931-006	EP2216931-007	EP2216931-008	EP2216931-009	EP2216931-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**25.0**	**26.7**	**23.9**	**5.3**	**34.9**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD306_221212	0089_SD314_221212	0089_SD308_221212	0089_SD316_221212	0089_SD407_221212
				Sampling date / time	13-Dec-2022 11:16	13-Dec-2022 11:17	13-Dec-2022 11:17	13-Dec-2022 11:18	13-Dec-2022 13:06
Compound	CAS Number	LOR	Unit		EP2216931-006	EP2216931-007	EP2216931-008	EP2216931-009	EP2216931-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**102**	**102**	**95.5**	**97.0**	**93.5**
13C8-PFOA	----	0.0002	%		**104**	**100**	**100**	**99.5**	**102**

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216931**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 22-Dec-2022
C-O-C number	: 46304	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4788457)									
EP2216874-008	Anonymous	EA055: Moisture Content	----	0.1	%	28.4	27.2	4.5	0% - 20%
EP2216880-011	Anonymous	EA055: Moisture Content	----	0.1	%	35.2	35.9	1.9	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4788458)									
EP2216931-008	0089_SD308_221212	EA055: Moisture Content	----	0.1	%	23.9	24.2	1.3	0% - 20%
ES2245394-001	Anonymous	EA055: Moisture Content	----	0.1	%	7.8	8.2	5.3	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4788478)									
EP2216931-010	0089_SD407_221212	EA055: Moisture Content	----	0.1	%	34.9	33.9	2.9	0% - 20%
EP2217214-028	Anonymous	EA055: Moisture Content	----	0.1	%	1.6	1.7	10.2	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4788885)									
EP2216931-001	0089_SD367_221212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0004	0.0003	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2216935-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4788885)									
EP2216931-001	0089_SD367_221212	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4788885) - continued									
EP2216931-001	0089_SD367_221212	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2216935-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4788885)									
EP2216931-001	0089_SD367_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2216935-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4788885) - continued									
EP2216935-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4788885)									
EP2216931-001	0089_SD367_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2216935-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4788885)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4788885)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	77.1	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.8	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	81.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788885)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.6	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.6	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.5	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4788885)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	95.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	95.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	85.6	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4788885) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	79.2	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4788885)							
EP2216931-001	0089_SD367_221212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	81.2	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	99.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	94.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	94.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	86.4	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	109	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4788885)							
EP2216931-001	0089_SD367_221212	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	88.6	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	105	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	102	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	101	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	107	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	104	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	95.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	104	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	115	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	95.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	98.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788885)							
EP2216931-001	0089_SD367_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	104	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	103	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	88.5	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	102	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	92.4	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788885) - continued							
EP2216931-001	0089_SD367_221212	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	103	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4788885)							
EP2216931-001	0089_SD367_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	90.8	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	97.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	92.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	92.8	69.2	143

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216931**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling SD - CG	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD367_221212, 0089_SD345_221212, 0089_SD369_221212, 0089_SD307_221212, 0089_SD315_221212, 0089_SD306_221212, 0089_SD314_221212, 0089_SD308_221212, 0089_SD316_221212, 0089_SD407_221212	**13-Dec-2022**	**----**	----	----	**22-Dec-2022**	27-Dec-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD367_221212, 0089_SD345_221212, 0089_SD369_221212, 0089_SD307_221212, 0089_SD315_221212, 0089_SD306_221212, 0089_SD314_221212, 0089_SD308_221212, 0089_SD316_221212, 0089_SD407_221212	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	01-Feb-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD367_221212, 0089_SD345_221212, 0089_SD369_221212, 0089_SD307_221212, 0089_SD315_221212, 0089_SD306_221212, 0089_SD314_221212, 0089_SD308_221212, 0089_SD316_221212, 0089_SD407_221212	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	01-Feb-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD367_221212, 0089_SD345_221212, 0089_SD369_221212, 0089_SD307_221212, 0089_SD315_221212, 0089_SD306_221212, 0089_SD314_221212, 0089_SD308_221212, 0089_SD316_221212, 0089_SD407_221212	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	01-Feb-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD367_221212, 0089_SD345_221212, 0089_SD369_221212, 0089_SD307_221212, 0089_SD315_221212, 0089_SD306_221212, 0089_SD314_221212, 0089_SD308_221212, 0089_SD316_221212, 0089_SD407_221212	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	01-Feb-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD367_221212, 0089_SD345_221212, 0089_SD369_221212, 0089_SD307_221212, 0089_SD315_221212, 0089_SD306_221212, 0089_SD314_221212, 0089_SD308_221212, 0089_SD316_221212, 0089_SD407_221212	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	01-Feb-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2216932

Telephone : -- 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP **Client:** Stantec Australia **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: **# Samples:** **Sampler:**

Phone:

46321; 46329; 46330; 46304; 46303; 46320; 46344; 46302

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 13/12/22 ~ 2:00pm	Date / Time: 13/12 17:00	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 46320 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW242		13/12/2022 08:37 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		lab QC
002	0089_MW243		13/12/2022 08:51 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_MW240		13/12/2022 09:02 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_MW238		13/12/2022 09:11 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_MW239		13/12/2022 09:27 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_MW245		13/12/2022 09:39 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_MW249		13/12/2022 09:51 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_MW496		13/12/2022 10:09 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_MW516		13/12/2022 10:19 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: 46320 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW233		13/12/2022 10:33 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		lab QC
011	0089_MW289		13/12/2022 11:26 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
012	0089_MW236		13/12/2022 11:42 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
013	0089_MW257		13/12/2022 11:52 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
014	0089_MW258		13/12/2022 12:07 PM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		lab QC
015	0089_MW259		13/12/2022 12:18 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
016	0089_MW256		13/12/2022 12:32 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
017	0089_MW255		13/12/2022 12:44 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
018	0089_MW227		13/12/2022 01:36 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 46320 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW242	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW243	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW240	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW238	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW239	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW245	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW249	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW496	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW516	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 46320 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_MW233	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_MW289	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_MW236	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_MW257	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_MW258	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0089_MW259	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
016	0089_MW256	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
017	0089_MW255	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
018	0089_MW227	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 46320 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW242	HDPE (no PTFE)	20 mL	00350522062409	Grey	No	
001	0089_MW242	HDPE (no PTFE)	20 mL	00350821000216	Grey	No	
001	0089_MW242	Clear Plastic Bottle - Natural	500 mL	00070522163668	Green	No	
001	0089_MW242	HDPE (no PTFE)	20 mL	00350522043156	Grey	No	
001	0089_MW242	HDPE (no PTFE)	20 mL	00350821000412	Grey	No	
001	0089_MW242	HDPE (no PTFE)	20 mL	00350522042933	Grey	No	
002	0089_MW243	Clear Plastic Bottle - Natural	500 mL	00070522146747	Green	No	
002	0089_MW243	HDPE (no PTFE)	20 mL	00350522062417	Grey	No	
002	0089_MW243	HDPE (no PTFE)	20 mL	00350522062451	Grey	No	
003	0089_MW240	HDPE (no PTFE)	20 mL	00350522062435	Grey	No	
003	0089_MW240	Clear Plastic Bottle - Natural	500 mL	00070522146749	Green	No	
003	0089_MW240	HDPE (no PTFE)	20 mL	00350522043115	Grey	No	
004	0089_MW238	HDPE (no PTFE)	20 mL	00350522042762	Grey	No	
004	0089_MW238	Clear Plastic Bottle - Natural	500 mL	00070522163775	Green	No	
004	0089_MW238	Clear Plastic Bottle - Natural	500 mL	00070522146716	Green	No	
005	0089_MW239	HDPE (no PTFE)	20 mL	00350522062458	Grey	No	
005	0089_MW239	HDPE (no PTFE)	20 mL	00350522042852	Grey	No	
005	0089_MW239	HDPE (no PTFE)	20 mL	00350522042779	Grey	No	
006	0089_MW245	Clear Plastic Bottle - Natural	500 mL	00070522163769	Green	No	
006	0089_MW245	HDPE (no PTFE)	20 mL	00350522042977	Grey	No	
006	0089_MW245	Clear Plastic Bottle - Natural	500 mL	00070522146737	Green	No	
007	0089_MW249	HDPE (no PTFE)	20 mL	00350522062416	Grey	No	
007	0089_MW249	HDPE (no PTFE)	20 mL	00350522062413	Grey	No	
007	0089_MW249	HDPE (no PTFE)	20 mL	00350522043087	Grey	No	
008	0089_MW496	Clear Plastic Bottle - Natural	500 mL	00070522163748	Green	No	
008	0089_MW496	HDPE (no PTFE)	20 mL	00350522042978	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 46320 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free Ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW516	HDPE (no PTFE)	20 mL	00350522042850	Grey	No	
009	0089_MW516	HDPE (no PTFE)	20 mL	00350522062423	Grey	No	
009	0089_MW516	Clear Plastic Bottle - Natural	500 mL	00070522146726	Green	No	
010	0089_MW233	HDPE (no PTFE)	20 mL	00350522062464	Grey	No	
010	0089_MW233	HDPE (no PTFE)	20 mL	00350522042908	Grey	No	
010	0089_MW233	HDPE (no PTFE)	20 mL	00350821000337	Grey	No	
010	0089_MW233	HDPE (no PTFE)	20 mL	00350821000333	Grey	No	
010	0089_MW233	Clear Plastic Bottle - Natural	500 mL	00070522143338	Green	No	
011	0089_MW289	Clear Plastic Bottle - Natural	500 mL	00070522146752	Green	No	
011	0089_MW289	HDPE (no PTFE)	20 mL	00350522042893	Grey	No	
011	0089_MW289	HDPE (no PTFE)	20 mL	00350522042860	Grey	No	
012	0089_MW236	Clear Plastic Bottle - Natural	500 mL	00070522146740	Green	No	
012	0089_MW236	HDPE (no PTFE)	20 mL	00350522043130	Grey	No	
012	0089_MW236	HDPE (no PTFE)	20 mL	00350522043140	Grey	No	
013	0089_MW257	Clear Plastic Bottle - Natural	500 mL	00070522163798	Green	No	
013	0089_MW257	HDPE (no PTFE)	20 mL	00350522043036	Grey	No	
013	0089_MW257	HDPE (no PTFE)	20 mL	00350522062440	Grey	No	
014	0089_MW258	HDPE (no PTFE)	20 mL	00350821000209	Grey	No	
014	0089_MW258	HDPE (no PTFE)	20 mL	00350821000247	Grey	No	
014	0089_MW258	HDPE (no PTFE)	20 mL	00350522042705	Grey	No	
014	0089_MW258	HDPE (no PTFE)	20 mL	00350522043060	Grey	No	
014	0089_MW258	Clear Plastic Bottle - Natural	500 mL	00070522143224	Green	No	
015	0089_MW259	HDPE (no PTFE)	20 mL	00350522043118	Grey	No	
015	0089_MW259	HDPE (no PTFE)	20 mL	00350522043059	Grey	No	
015	0089_MW259	Clear Plastic Bottle - Natural	500 mL	00070522143124	Green	No	
016	0089_MW256	HDPE (no PTFE)	20 mL	00350522043083	Grey	No	
016	0089_MW256	HDPE (no PTFE)	20 mL	00350522042846	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 46320 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

016	0089_MW256	Clear Plastic Bottle - Natural	500 mL	00070522163743	Green	No	
017	0089_MW255	HDPE (no PTFE)	20 mL	00350522062410	Grey	No	
017	0089_MW255	HDPE (no PTFE)	20 mL	00350522042997	Grey	No	
017	0089_MW255	Clear Plastic Bottle - Natural	500 mL	00070522146753	Green	No	
018	0089_MW227	HDPE (no PTFE)	20 mL	00350522043124	Grey	No	
018	0089_MW227	Clear Plastic Bottle - Natural	500 mL	00070522163688	Green	No	
018	0089_MW227	HDPE (no PTFE)	20 mL	00350522043001	Grey	No	

Total Bottle Count: ALS: 60, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216932**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46320	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 17:00	Issue Date	: 20-Dec-2022
Client Requested Due Date	: 30-Dec-2022	Scheduled Reporting Date	: **30-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 18.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 18 / 18

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2216932-001	13-Dec-2022 08:37	0089_MW242_221213	✓	✓	✓	✓
EP2216932-002	13-Dec-2022 08:51	0089_MW243_221213	✓	✓	✓	✓
EP2216932-003	13-Dec-2022 09:02	0089_MW240_221213	✓	✓	✓	✓
EP2216932-004	13-Dec-2022 09:11	0089_MW238_221213	✓	✓	✓	✓
EP2216932-005	13-Dec-2022 09:27	0089_MW239_221213	✓	✓	✓	✓
EP2216932-006	13-Dec-2022 09:39	0089_MW245_221213	✓	✓	✓	✓
EP2216932-007	13-Dec-2022 09:51	0089_MW249_221213	✓	✓	✓	✓
EP2216932-008	13-Dec-2022 10:09	0089_MW496_221213	✓	✓	✓	✓
EP2216932-009	13-Dec-2022 10:19	0089_MW516_221213	✓	✓	✓	✓
EP2216932-010	13-Dec-2022 10:33	0089_MW233_221213	✓	✓	✓	✓
EP2216932-011	13-Dec-2022 11:26	0089_MW289_221213	✓	✓	✓	✓
EP2216932-012	13-Dec-2022 11:42	0089_MW236_221213	✓	✓	✓	✓
EP2216932-013	13-Dec-2022 11:52	0089_MW257_221213	✓	✓	✓	✓
EP2216932-014	13-Dec-2022 12:07	0089_MW258_221213	✓	✓	✓	✓
EP2216932-015	13-Dec-2022 12:18	0089_MW259_221213	✓	✓	✓	✓
EP2216932-016	13-Dec-2022 12:32	0089_MW256_221213	✓	✓	✓	✓
EP2216932-017	13-Dec-2022 12:44	0089_MW255_221213	✓	✓	✓	✓
EP2216932-018	13-Dec-2022 13:36	0089_MW227_221213	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216932**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Dec-2022
C-O-C number	: 46320	Issue Date	: 30-Dec-2022 17:45
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 18		
No. of samples analysed	: 18		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X: Positive result for analyte Perfluorohexane sulfonic acid (PFHxS) on sample EP2216932_004 has been confirmed by re-extraction and re-analysis.
- EP231X: Positive result for analyte Perfluorooctane sulfonic acid (PFOS) on sample EP2216932_001 has been confirmed by re-extraction and re-analysis.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW242_221213	0089_MW243_221213	0089_MW240_221213	0089_MW238_221213	0089_MW239_221213
				Sampling date / time	13-Dec-2022 08:37	13-Dec-2022 08:51	13-Dec-2022 09:02	13-Dec-2022 09:11	13-Dec-2022 09:27
					EP2216932-001	EP2216932-002	EP2216932-003	EP2216932-004	EP2216932-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**193**	**268**	**252**	**214**	**194**
Total Alkalinity as CaCO3	----	1	mg/L		**193**	**268**	**252**	**214**	**194**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**26**	**47**	**36**	**45**	**24**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**14**	**65**	**41**	**34**	**37**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**65**	**125**	**106**	**88**	**80**
Magnesium	7439-95-4	1	mg/L		**10**	**18**	**10**	**15**	**10**
Sodium	7440-23-5	1	mg/L		**11**	**39**	**26**	**27**	**21**
Potassium	7440-09-7	1	mg/L		**1**	**4**	**3**	**4**	**3**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**4.79**	**8.17**	**6.94**	**6.17**	**5.42**
ø Total Cations	----	0.01	meq/L		**4.57**	**9.52**	**7.32**	**6.90**	**5.80**
ø Ionic Balance	----	0.01	%		**2.37**	**7.64**	**2.66**	**5.59**	**3.44**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.07**	**0.77**	**0.03**	**0.09**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.01**	**0.01**	<0.01	<0.01	**0.24**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**0.07**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.02**	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW242_221213	0089_MW243_221213	0089_MW240_221213	0089_MW238_221213	0089_MW239_221213
				Sampling date / time	13-Dec-2022 08:37	13-Dec-2022 08:51	13-Dec-2022 09:02	13-Dec-2022 09:11	13-Dec-2022 09:27
Compound	CAS Number	LOR	Unit		EP2216932-001	EP2216932-002	EP2216932-003	EP2216932-004	EP2216932-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.06**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW242_221213	0089_MW243_221213	0089_MW240_221213	0089_MW238_221213	0089_MW239_221213
				Sampling date / time	13-Dec-2022 08:37	13-Dec-2022 08:51	13-Dec-2022 09:02	13-Dec-2022 09:11	13-Dec-2022 09:27
Compound	CAS Number	LOR	Unit		EP2216932-001	EP2216932-002	EP2216932-003	EP2216932-004	EP2216932-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.01**	**0.08**	**0.92**	**0.03**	**0.33**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	**0.08**	**0.77**	**0.03**	**0.33**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	**0.08**	**0.92**	**0.03**	**0.33**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.5**	**91.3**	**83.3**	**88.5**	**101**
13C8-PFOA	----	0.02	%		**92.8**	**88.4**	**88.5**	**93.4**	**106**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW245_221213	0089_MW249_221213	0089_MW496_221213	0089_MW516_221213	0089_MW233_221213
				Sampling date / time	13-Dec-2022 09:39	13-Dec-2022 09:51	13-Dec-2022 10:09	13-Dec-2022 10:19	13-Dec-2022 10:33
					EP2216932-006	EP2216932-007	EP2216932-008	EP2216932-009	EP2216932-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	**4**	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**246**	**469**	**369**	**400**	**152**
Total Alkalinity as CaCO3	----	1	mg/L		**246**	**469**	**374**	**400**	**152**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2**	**53**	**99**	**76**	**8**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**34**	**115**	**185**	**51**	**24**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**83**	**91**	**76**	**94**	**44**
Magnesium	7439-95-4	1	mg/L		**8**	**37**	**41**	**40**	**6**
Sodium	7440-23-5	1	mg/L		**18**	**91**	**136**	**57**	**12**
Potassium	7440-09-7	1	mg/L		**2**	**6**	**12**	**13**	**2**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**5.92**	**13.7**	**14.8**	**11.0**	**3.88**
ø Total Cations	----	0.01	meq/L		**5.63**	**11.7**	**13.4**	**10.8**	**3.26**
ø Ionic Balance	----	0.01	%		**2.44**	**7.95**	**4.84**	**1.00**	**8.65**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.06**	**0.08**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	**0.07**	**0.03**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.22**	**1.08**	**0.39**	**0.06**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	**0.14**	**0.03**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.06**	**0.10**	**8.00**	**1.62**	**0.17**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.02**	**0.12**	**0.02**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.03**	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW245_221213	0089_MW249_221213	0089_MW496_221213	0089_MW516_221213	0089_MW233_221213
				Sampling date / time	13-Dec-2022 09:39	13-Dec-2022 09:51	13-Dec-2022 10:09	13-Dec-2022 10:19	13-Dec-2022 10:33
Compound	CAS Number	LOR	Unit		EP2216932-006	EP2216932-007	EP2216932-008	EP2216932-009	EP2216932-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.10**	**0.02**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW245_221213	0089_MW249_221213	0089_MW496_221213	0089_MW516_221213	0089_MW233_221213
				Sampling date / time	13-Dec-2022 09:39	13-Dec-2022 09:51	13-Dec-2022 10:09	13-Dec-2022 10:19	13-Dec-2022 10:33
Compound	CAS Number	LOR	Unit		EP2216932-006	EP2216932-007	EP2216932-008	EP2216932-009	EP2216932-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.06**	**0.34**	**9.60**	**2.19**	**0.23**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.06**	**0.32**	**9.08**	**2.01**	**0.23**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.06**	**0.34**	**9.39**	**2.13**	**0.23**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**104**	**101**	**100**	**111**
13C8-PFOA	----	0.02	%		**107**	**98.9**	**103**	**105**	**102**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW289_221213	0089_MW236_221213	0089_MW257_221213	0089_MW258_221213	0089_MW259_221213
				Sampling date / time	13-Dec-2022 11:26	13-Dec-2022 11:42	13-Dec-2022 11:52	13-Dec-2022 12:07	13-Dec-2022 12:18
Compound	CAS Number	LOR	Unit		EP2216932-011	EP2216932-012	EP2216932-013	EP2216932-014	EP2216932-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		4	<1	4	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		281	253	187	311	210
Total Alkalinity as CaCO3	----	1	mg/L		285	253	191	311	210
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		55	26	22	91	9
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		91	37	34	139	32
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		83	91	66	141	68
Magnesium	7439-95-4	1	mg/L		22	16	8	34	9
Sodium	7440-23-5	1	mg/L		81	28	28	77	20
Potassium	7440-09-7	1	mg/L		6	<1	6	14	<1
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		9.41	6.64	5.23	12.0	5.28
ø Total Cations	----	0.01	meq/L		9.63	7.08	5.32	13.5	5.00
ø Ionic Balance	----	0.01	%		1.17	3.18	0.85	5.91	2.74
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.04	0.22	<0.02	2.72	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.06	0.66	<0.02	1.85	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.56	27.7	0.35	6.38	0.02
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.03	0.46	<0.02	0.29	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		1.49	60.5	0.03	5.16	0.08
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	0.8	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	0.15	0.12	2.23	0.06
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		0.04	0.97	0.09	3.57	0.04
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	0.54	<0.02	0.50	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW289_221213	0089_MW236_221213	0089_MW257_221213	0089_MW258_221213	0089_MW259_221213
				Sampling date / time	13-Dec-2022 11:26	13-Dec-2022 11:42	13-Dec-2022 11:52	13-Dec-2022 12:07	13-Dec-2022 12:18
Compound	CAS Number	LOR	Unit		EP2216932-011	EP2216932-012	EP2216932-013	EP2216932-014	EP2216932-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.03**	**1.46**	**0.01**	**0.34**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**2.68**	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	**0.19**	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW289_221213	0089_MW236_221213	0089_MW257_221213	0089_MW258_221213	0089_MW259_221213
				Sampling date / time	13-Dec-2022 11:26	13-Dec-2022 11:42	13-Dec-2022 11:52	13-Dec-2022 12:07	13-Dec-2022 12:18
					EP2216932-011	EP2216932-012	EP2216932-013	EP2216932-014	EP2216932-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**2.25**	**95.3**	**0.60**	**24.0**	**0.20**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**2.05**	**88.2**	**0.38**	**11.5**	**0.10**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**2.16**	**91.5**	**0.60**	**21.9**	**0.20**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.7**	**98.9**	**105**	**106**	**102**
13C8-PFOA	----	0.02	%		**106**	**105**	**103**	**103**	**101**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW256_221213	0089_MW255_221213	0089_MW227_221213	----	----
				Sampling date / time	13-Dec-2022 12:32	13-Dec-2022 12:44	13-Dec-2022 13:36	----	----
Compound	CAS Number	LOR	Unit		EP2216932-016	EP2216932-017	EP2216932-018	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		426	294	381	----	----
Total Alkalinity as CaCO3	----	1	mg/L		426	294	381	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		64	37	220	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		347	88	632	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		138	102	99	----	----
Magnesium	7439-95-4	1	mg/L		38	17	57	----	----
Sodium	7440-23-5	1	mg/L		174	55	409	----	----
Potassium	7440-09-7	1	mg/L		9	4	25	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		19.6	9.13	30.0	----	----
ø Total Cations	----	0.01	meq/L		17.8	8.98	28.1	----	----
ø Ionic Balance	----	0.01	%		4.86	0.79	3.37	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		1.56	0.23	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.61	0.43	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		3.36	10.6	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.11	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		3.59	0.55	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		0.6	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.97	0.10	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		1.86	0.58	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.14	0.18	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW256_221213	0089_MW255_221213	0089_MW227_221213	----	----
				Sampling date / time	13-Dec-2022 12:32	13-Dec-2022 12:44	13-Dec-2022 13:36	----	----
Compound	CAS Number	LOR	Unit		EP2216932-016	EP2216932-017	EP2216932-018	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.18**	**0.03**	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		**0.04**	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.12**	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW256_221213	0089_MW255_221213	0089_MW227_221213	----	----
				Sampling date / time	13-Dec-2022 12:32	13-Dec-2022 12:44	13-Dec-2022 13:36	----	----
Compound	CAS Number	LOR	Unit		EP2216932-016	EP2216932-017	EP2216932-018	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**13.1**	**12.7**	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**6.95**	**11.2**	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**12.4**	**12.3**	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**96.8**	**106**	----	----
13C8-PFOA	----	0.02	%		**101**	**103**	**101**	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216932**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Dec-2022
C-O-C number	: 46320	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 18		
No. of samples analysed	: 18		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4787472)									
EP2216929-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	225	227	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	225	227	1.1	0% - 20%
EP2216930-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	121	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	121	1.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4787473)									
EP2216932-008	0089_MW496_221213	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	4	4	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	369	371	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	374	376	0.6	0% - 20%
EP2216932-018	0089_MW227_221213	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	4	127	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	381	382	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	381	386	1.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791357)									
EP2216930-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2870	2880	0.0	0% - 20%
EP2216932-010	0089_MW233_221213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	8	8	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4791356)									
EP2216930-007	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19000	19400	1.7	0% - 20%
EP2216932-010	0089_MW233_221213	ED045G: Chloride	16887-00-6	1	mg/L	24	24	0.0	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED093F: Dissolved Major Cations (QC Lot: 4781669)									
EP2216929-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	68	70	2.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	19	20	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	24	24	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EP2216932-001	0089_MW242_221213	ED093F: Calcium	7440-70-2	1	mg/L	65	65	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	10	10	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	11	10	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4781670)									
EP2216932-011	0089_MW289_221213	ED093F: Calcium	7440-70-2	1	mg/L	83	78	7.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	22	21	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	81	80	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
EP2216933-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	164	169	3.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	20	20	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	26	26	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4781786)									
EP2216929-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	127	127	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	305	304	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1910	1900	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	107	107	0.0	0% - 20%
EP2217224-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2890	3030	4.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1210	1270	4.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	12200	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	413	432	4.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4789075)									
EP2216902-013	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.33	0.28	15.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	6.43	5.62	13.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.09	0.07	28.4	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4789080)									
EP2216932-010	0089_MW233_221213	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.17	0.16	6.2	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4789080) - continued									
EP2216932-010	0089_MW233_221213	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2216933-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.09	0.06	29.7	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4789075)									
EP2216902-013	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.05	0.04	29.2	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.04	57.1	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4789080)									
EP2216932-010	0089_MW233_221213	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2216933-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.24	0.24	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.86	1.94	4.3	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.63	1.66	1.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.50	0.49	0.0	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4789080) - continued									
EP2216933-001	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.5	0.6	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4789075)									
EP2216902-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4789080)									
EP2216932-010	0089_MW233_221213	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216933-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4789080) - continued									
EP2216933-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4789075)									
EP2216902-013	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4789080)									
EP2216932-010	0089_MW233_221213	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216933-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	10.2	10.5	2.2	0% - 20%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	0.30	0.24	18.7	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4789075)									
EP2216902-013	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	6.99	6.13	13.1	0% - 20%
EP231P: PFAS Sums (QC Lot: 4789080)									
EP2216932-010	0089_MW233_221213	EP231X: Sum of PFAS	----	0.01	µg/L	0.23	0.22	4.4	0% - 20%
EP2216933-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	15.4	15.8	2.6	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4787472)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	100	87.8	118
				<1	200 mg/L	93.3	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 4787473)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	101	87.8	118
				<1	200 mg/L	92.7	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791357)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	89.9	112
				<1	500 mg/L	99.6	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791356)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	94.5	88.6	113
				<1	1000 mg/L	93.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4781669)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4781670)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4781786)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	108	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	84.6	108

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789075)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	73.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	86.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	82.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	81.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	76.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	69.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789080)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	82.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	83.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	88.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	85.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	86.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789075)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	77.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	83.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	87.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	92.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789080)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	85.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	85.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	88.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789075)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789075) - continued								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	79.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	77.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	71.4	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	78.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	80.6	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	85.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	75.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789080)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	91.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	76.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	67.8	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	84.1	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.0	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	107	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	93.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789075)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	88.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	76.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	70.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	78.2	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789080)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	83.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	92.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	112	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	92.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791357)							
EP2216930-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791356)							
EP2216930-007	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789075)							
EP2216932-001	0089_MW242_221213	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	82.0	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	94.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	85.0	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	88.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	76.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	76.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789080)							
EP2216932-014	0089_MW258_221213	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	# Not Determined	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	# Not Determined	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	97.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	98.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789075)							
EP2216932-001	0089_MW242_221213	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	81.7	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	93.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	83.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	93.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	88.2	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	90.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	90.2	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	97.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	130	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	109	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789080)							
EP2216932-014	0089_MW258_221213	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	79.8	73.0	129

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789080) - continued							
EP2216932-014	0089_MW258_221213	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	74.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	75.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	93.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	77.4	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	89.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	95.8	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	93.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	89.3	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789075)							
EP2216932-001	0089_MW242_221213	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	89.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	106	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	83.6	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	91.0	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	87.9	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	94.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	80.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789080)							
EP2216932-014	0089_MW258_221213	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	87.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	86.4	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	82.9	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	84.6	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	89.7	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	96.0	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	87.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789075)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789075) - continued							
EP2216932-001	0089_MW242_221213	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	98.8	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	97.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	81.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	73.2	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789080)							
EP2216932-014	0089_MW258_221213	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	94.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	103	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	90.4	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	86.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216932**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling GW - MB	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 18
Order number	: pfas-omp/Stirling	No. of samples analysed	: 18

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216930--007	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216930--007	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2216932--014	0089_MW258_221213	**Perfluorobutane sulfonic acid (PFBS)**	375-73-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2216932--014	0089_MW258_221213	**Perfluoropentane sulfonic acid (PFPeS)**	2706-91-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2216932--014	0089_MW258_221213	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2216932--014	0089_MW258_221213	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2216932--014	0089_MW258_221213	**Perfluoropentanoic acid (PFPeA)**	2706-90-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2216932--014	0089_MW258_221213	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	**Days overdue**	Date analysed	Due for analysis	**Days overdue**
ED093F: Dissolved Major Cations						

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
ED093F: Dissolved Major Cations - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
0089_MW242_221213, 0089_MW243_221213, 0089_MW240_221213, 0089_MW238_221213, 0089_MW239_221213, 0089_MW245_221213, 0089_MW249_221213, 0089_MW496_221213, 0089_MW516_221213, 0089_MW233_221213, 0089_MW289_221213, 0089_MW236_221213, 0089_MW257_221213, 0089_MW258_221213, 0089_MW259_221213, 0089_MW256_221213, 0089_MW255_221213	----	----	----	21-Dec-2022	20-Dec-2022	**1**
Clear Plastic Bottle - Natural						
0089_MW227_221213	----	----	----	28-Dec-2022	20-Dec-2022	**8**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	3	40	7.50	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW242_221213, 0089_MW243_221213, 0089_MW240_221213, 0089_MW238_221213, 0089_MW239_221213, 0089_MW245_221213, 0089_MW249_221213, 0089_MW496_221213, 0089_MW516_221213, 0089_MW233_221213, 0089_MW289_221213, 0089_MW236_221213, 0089_MW257_221213, 0089_MW258_221213, 0089_MW259_221213, 0089_MW256_221213, 0089_MW255_221213, 0089_MW227_221213	**13-Dec-2022**	**----**	----	----	**22-Dec-2022**	27-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW242_221213, 0089_MW243_221213, 0089_MW240_221213, 0089_MW238_221213, 0089_MW239_221213, 0089_MW245_221213, 0089_MW249_221213, 0089_MW496_221213, 0089_MW516_221213, 0089_MW233_221213, 0089_MW289_221213, 0089_MW236_221213, 0089_MW257_221213, 0089_MW258_221213, 0089_MW259_221213, 0089_MW256_221213, 0089_MW255_221213, 0089_MW227_221213	**13-Dec-2022**	**----**	----	----	**30-Dec-2022**	10-Jan-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW242_221213, 0089_MW243_221213, 0089_MW240_221213, 0089_MW238_221213, 0089_MW239_221213, 0089_MW245_221213, 0089_MW249_221213, 0089_MW496_221213, 0089_MW516_221213, 0089_MW233_221213, 0089_MW289_221213, 0089_MW236_221213, 0089_MW257_221213, 0089_MW258_221213, 0089_MW259_221213, 0089_MW256_221213, 0089_MW255_221213, 0089_MW227_221213	**13-Dec-2022**	**----**	----	----	**30-Dec-2022**	10-Jan-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW242_221213, 0089_MW243_221213, 0089_MW240_221213, 0089_MW238_221213, 0089_MW239_221213, 0089_MW245_221213, 0089_MW249_221213, 0089_MW496_221213, 0089_MW516_221213, 0089_MW233_221213, 0089_MW289_221213, 0089_MW236_221213, 0089_MW257_221213, 0089_MW258_221213, 0089_MW259_221213, 0089_MW256_221213, 0089_MW255_221213	**13-Dec-2022**	**----**	----	----	**21-Dec-2022**	20-Dec-2022	×
Clear Plastic Bottle - Natural (ED093F)							
0089_MW227_221213	**13-Dec-2022**	**----**	----	----	**28-Dec-2022**	20-Dec-2022	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW242_221213, 0089_MW243_221213, 0089_MW240_221213, 0089_MW238_221213	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW239_221213, 0089_MW245_221213, 0089_MW249_221213, 0089_MW496_221213, 0089_MW516_221213, 0089_MW233_221213, 0089_MW289_221213, 0089_MW236_221213, 0089_MW257_221213, 0089_MW258_221213, 0089_MW259_221213, 0089_MW256_221213, 0089_MW255_221213, 0089_MW227_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW242_221213, 0089_MW243_221213, 0089_MW240_221213, 0089_MW238_221213	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW239_221213, 0089_MW245_221213, 0089_MW249_221213, 0089_MW496_221213, 0089_MW516_221213, 0089_MW233_221213, 0089_MW289_221213, 0089_MW236_221213, 0089_MW257_221213, 0089_MW258_221213, 0089_MW259_221213, 0089_MW256_221213, 0089_MW255_221213, 0089_MW227_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW242_221213, 0089_MW243_221213, 0089_MW240_221213, 0089_MW238_221213	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW239_221213, 0089_MW245_221213, 0089_MW249_221213, 0089_MW496_221213, 0089_MW516_221213, 0089_MW233_221213, 0089_MW289_221213, 0089_MW236_221213, 0089_MW257_221213, 0089_MW258_221213, 0089_MW259_221213, 0089_MW256_221213, 0089_MW255_221213, 0089_MW227_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW242_221213, 0089_MW243_221213, 0089_MW240_221213, 0089_MW238_221213	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW239_221213, 0089_MW245_221213, 0089_MW249_221213, 0089_MW496_221213, 0089_MW516_221213, 0089_MW233_221213, 0089_MW289_221213, 0089_MW236_221213, 0089_MW257_221213, 0089_MW258_221213, 0089_MW259_221213, 0089_MW256_221213, 0089_MW255_221213, 0089_MW227_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW242_221213, 0089_MW243_221213, 0089_MW240_221213, 0089_MW238_221213	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**29-Dec-2022**	11-Jun-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW239_221213, 0089_MW245_221213, 0089_MW249_221213, 0089_MW496_221213, 0089_MW516_221213, 0089_MW233_221213, 0089_MW289_221213, 0089_MW236_221213, 0089_MW257_221213, 0089_MW258_221213, 0089_MW259_221213, 0089_MW256_221213, 0089_MW255_221213, 0089_MW227_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	6	57	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	40	**7.50**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	57	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	57	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass SAMPLING Intelligence

ALS

Environmental Division
Perth
Work Order Reference
EP2216933

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP **Client:** Stantec Australia **Project Manager:** [redacted]

Phone: ([redacted])

ALS Compass COC Reference: **# Samples:** **Sampler:** [redacted]

Phone: ([redacted])

46321; 46329; 46330; 46304; 46303; 46320; 46344; 46302

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 13/12/22 ~ 2:00pm	Date / Time: 13/12 17:00	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 46321 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW217		13/12/2022 08:30 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
002	0089_MW220		13/12/2022 08:46 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_MW224		13/12/2022 08:59 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
004	0089_MW282		13/12/2022 09:20 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
005	0089_MW268		13/12/2022 10:06 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_MW269		13/12/2022 10:24 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_MW226		13/12/2022 12:47 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 46321 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW217	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW220	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW224	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW282	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW268	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW269	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW226	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 46321 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW217	Clear Plastic Bottle - Natural	500 mL	00070522143170	Green	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00350522017913	Grey	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00350522017797	Grey	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00350621016617	Grey	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00350621016862	Grey	No	
001	0089_MW217	Clear Plastic Bottle - Natural	500 mL	00070522143167	Green	No	
002	0089_MW220	HDPE (no PTFE)	20 mL	00350522017758	Grey	No	
002	0089_MW220	HDPE (no PTFE)	20 mL	00350522017759	Grey	No	
002	0089_MW220	Clear Plastic Bottle - Natural	500 mL	00070522143169	Green	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00350522062518	Grey	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00350522018039	Grey	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00350621016779	Grey	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00350621016806	Grey	No	
003	0089_MW224	Clear Plastic Bottle - Natural	500 mL	00070522143063	Green	No	
004	0089_MW282	HDPE (no PTFE)	20 mL	00350522017775	Grey	No	
004	0089_MW282	HDPE (no PTFE)	20 mL	00350522017757	Grey	No	
004	0089_MW282	HDPE (no PTFE)	20 mL	00350621016766	Grey	No	
004	0089_MW282	HDPE (no PTFE)	20 mL	00350621016838	Grey	No	
004	0089_MW282	Clear Plastic Bottle - Natural	500 mL	00070522143367	Green	No	
005	0089_MW268	HDPE (no PTFE)	20 mL	00350522062576	Grey	No	
005	0089_MW268	HDPE (no PTFE)	20 mL	00350522062559	Grey	No	
005	0089_MW268	Clear Plastic Bottle - Natural	500 mL	00070522143072	Green	No	
006	0089_MW269	HDPE (no PTFE)	20 mL	00350522062504	Grey	No	
006	0089_MW269	HDPE (no PTFE)	20 mL	00350522017813	Grey	No	
006	0089_MW269	Clear Plastic Bottle - Natural	500 mL	00070522143317	Green	No	
007	0089_MW226	HDPE (no PTFE)	20 mL	00350522042756	Grey	No	
007	0089_MW226						

CHAIN OF CUSTODY

COC#: 46321 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

007	0089_MW226	HDPE (no PTFE)	20 mL	00350522042728	Grey	No	

Total Bottle Count: ALS: 27, Non ALS: 0

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216933**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46321	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 17:00	Issue Date	: 19-Dec-2022
Client Requested Due Date	: 30-Dec-2022	Scheduled Reporting Date	: **30-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 18.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2216933-001	13-Dec-2022 08:30	0089_MW217_221213	✓	✓	✓	✓
EP2216933-002	13-Dec-2022 08:46	0089_MW220_221213	✓	✓	✓	✓
EP2216933-003	13-Dec-2022 08:59	0089_MW224_221213	✓	✓	✓	✓
EP2216933-004	13-Dec-2022 09:20	0089_MW282_221213	✓	✓	✓	✓
EP2216933-005	13-Dec-2022 10:06	0089_MW268_221213	✓	✓	✓	✓
EP2216933-006	13-Dec-2022 10:24	0089_MW269_221213	✓	✓	✓	✓
EP2216933-007	13-Dec-2022 12:47	0089_MW226_221213	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216933**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Dec-2022
C-O-C number	: 46321	Issue Date	: 30-Dec-2022 13:16
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_221213	0089_MW220_221213	0089_MW224_221213	0089_MW282_221213	0089_MW268_221213
				Sampling date / time	13-Dec-2022 08:30	13-Dec-2022 08:46	13-Dec-2022 08:59	13-Dec-2022 09:20	13-Dec-2022 10:06
Compound	CAS Number	LOR	Unit		EP2216933-001	EP2216933-002	EP2216933-003	EP2216933-004	EP2216933-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	4	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		288	259	220	430	434
Total Alkalinity as CaCO3	----	1	mg/L		288	259	224	430	434
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		33	27	35	16	734
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		75	41	110	40	3090
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		111	92	61	164	218
Magnesium	7439-95-4	1	mg/L		15	13	22	20	280
Sodium	7440-23-5	1	mg/L		39	30	91	26	1710
Potassium	7440-09-7	1	mg/L		7	10	4	<1	94
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		8.56	6.89	8.31	10.0	111
ø Total Cations	----	0.01	meq/L		8.65	7.22	8.92	11.0	111
ø Ionic Balance	----	0.01	%		0.53	2.32	3.53	4.32	0.18
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.14	<0.02	0.70	0.05
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.08	<0.02	2.70	0.05
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.03	1.22	<0.01	41.1	0.34
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.21	<0.02	11.2	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.09	22.4	<0.01	66.8	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		0.5	0.2	<0.1	0.3	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		1.86	0.27	<0.02	0.56	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		1.63	0.39	<0.02	3.55	0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.50	0.08	<0.02	1.06	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_221213	0089_MW220_221213	0089_MW224_221213	0089_MW282_221213	0089_MW268_221213
				Sampling date / time	13-Dec-2022 08:30	13-Dec-2022 08:46	13-Dec-2022 08:59	13-Dec-2022 09:20	13-Dec-2022 10:06
Compound	CAS Number	LOR	Unit		EP2216933-001	EP2216933-002	EP2216933-003	EP2216933-004	EP2216933-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.24**	**0.16**	<0.01	**11.8**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.03**	<0.02	**0.04**	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**10.2**	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**0.30**	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_221213	0089_MW220_221213	0089_MW224_221213	0089_MW282_221213	0089_MW268_221213
				Sampling date / time	13-Dec-2022 08:30	13-Dec-2022 08:46	13-Dec-2022 08:59	13-Dec-2022 09:20	13-Dec-2022 10:06
Compound	CAS Number	LOR	Unit		EP2216933-001	EP2216933-002	EP2216933-003	EP2216933-004	EP2216933-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**15.4**	**25.2**	<0.01	**140**	**0.46**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.12**	**23.6**	<0.01	**108**	**0.34**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**15.4**	**24.9**	<0.01	**126**	**0.41**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**104**	**99.2**	**69.3**	**99.3**
13C8-PFOA	----	0.02	%		**103**	**103**	**102**	**98.7**	**103**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_221213	0089_MW226_221213	----	----	----
				Sampling date / time	13-Dec-2022 10:24	13-Dec-2022 12:47	----	----	----
Compound	CAS Number	LOR	Unit		EP2216933-006	EP2216933-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**350**	**592**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**350**	**592**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**62**	**2110**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**128**	**15500**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**110**	**406**	----	----	----
Magnesium	7439-95-4	1	mg/L		**35**	**1070**	----	----	----
Sodium	7440-23-5	1	mg/L		**76**	**8420**	----	----	----
Potassium	7440-09-7	1	mg/L		**7**	**461**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**11.9**	**493**	----	----	----
ø Total Cations	----	0.01	meq/L		**11.8**	**486**	----	----	----
ø Ionic Balance	----	0.01	%		**0.17**	**0.68**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.10**	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.19**	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.02**	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_221213	0089_MW226_221213	----	----	----
				Sampling date / time	13-Dec-2022 10:24	13-Dec-2022 12:47	----	----	----
Compound	CAS Number	LOR	Unit		EP2216933-006	EP2216933-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_221213	0089_MW226_221213	----	----	----
				Sampling date / time	13-Dec-2022 10:24	13-Dec-2022 12:47	----	----	----
Compound	CAS Number	LOR	Unit		EP2216933-006	EP2216933-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.31**	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.29**	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.31**	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.2**	**92.3**	----	----	----
13C8-PFOA	----	0.02	%		**100**	**100**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216933**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Dec-2022
C-O-C number	: 46321	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4787473)									
EP2216932-008	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	4	4	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	369	371	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	374	376	0.6	0% - 20%
EP2216932-018	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	4	127	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	381	382	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	381	386	1.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791359)									
EP2216933-001	0089_MW217_221213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	33	33	0.0	0% - 20%
EP2216934-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2530	2540	0.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791358)									
EP2216933-001	0089_MW217_221213	ED045G: Chloride	16887-00-6	1	mg/L	75	72	3.3	0% - 20%
EP2216934-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	20500	20500	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4781670)									
EP2216932-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	83	78	7.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	22	21	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	81	80	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
EP2216933-004	0089_MW282_221213	ED093F: Calcium	7440-70-2	1	mg/L	164	169	3.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	20	20	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	26	26	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED093F: Dissolved Major Cations (QC Lot: 4781786)									
EP2216929-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	127	127	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	305	304	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1910	1900	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	107	107	0.0	0% - 20%
EP2217224-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2890	3030	4.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1210	1270	4.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	12200	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	413	432	4.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4789080)									
EP2216932-010	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.17	0.16	6.2	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2216933-001	0089_MW217_221213	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.09	0.06	29.7	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2216973-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4789080)									
EP2216932-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4789080) - continued									
EP2216932-010	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2216933-001	0089_MW217_221213	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.24	0.24	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.86	1.94	4.3	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.63	1.66	1.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.50	0.49	0.0	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.5	0.6	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2216973-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4789080)									
EP2216932-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216933-001	0089_MW217_221213	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216973-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4790398) - continued									
EP2216973-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4789080)									
EP2216932-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216933-001	0089_MW217_221213	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	10.2	10.5	2.2	0% - 20%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	0.30	0.24	18.7	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216973-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4790398) - continued									
EP2216973-001	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4789080)									
EP2216932-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.23	0.22	4.4	0% - 20%
EP2216933-001	0089_MW217_221213	EP231X: Sum of PFAS	----	0.01	µg/L	15.4	15.8	2.6	0% - 20%
EP231P: PFAS Sums (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2216973-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4787473)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	101	87.8	118
				<1	200 mg/L	92.7	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791359)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	94.5	89.9	112
				<1	500 mg/L	90.3	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791358)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	91.9	88.6	113
				<1	1000 mg/L	103	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4781670)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4781786)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	108	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789080)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	82.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	83.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	88.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	85.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	86.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790398)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	72.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	72.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	69.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	71.4	69.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790398) - continued								
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	67.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	70.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789080)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	85.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	85.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	88.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790398)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	82.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	76.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	74.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	76.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	76.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	82.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	74.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	77.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	70.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	80.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789080)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	91.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	76.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	67.8	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	84.1	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.0	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	107	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	93.4	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790398)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	70.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	71.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	66.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	72.3	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	71.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	70.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789080)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	83.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	92.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	112	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	92.2	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4790398)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	73.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	67.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	83.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	71.8	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791359)							
EP2216933-001	0089_MW217_221213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	109	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791358)							
EP2216933-001	0089_MW217_221213	ED045G: Chloride	16887-00-6	1000 mg/L	106	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789080)							
EP2216932-014	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	# Not Determined	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	# Not Determined	71.0	127

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789080) - continued							
EP2216932-014	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	97.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	98.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790398)							
EP2216934-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	88.2	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	85.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	76.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	86.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	77.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	86.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789080)							
EP2216932-014	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	79.8	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	74.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	75.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	93.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	77.4	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	89.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	95.8	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	93.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	89.3	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790398)							
EP2216934-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	82.4	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	88.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	91.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	94.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	87.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	100	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	83.4	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	85.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	90.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	93.3	71.0	132

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789080)							
EP2216932-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	87.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	86.4	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	82.9	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	84.6	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	89.7	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	96.0	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	87.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790398)							
EP2216934-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	79.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	83.5	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	77.2	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	85.0	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.1	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	84.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789080)							
EP2216932-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	94.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	103	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	90.4	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	86.2	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4790398)							
EP2216934-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	89.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	85.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	84.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	72.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216933**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling GW - JS	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2216932--014	Anonymous	**Perfluorobutane sulfonic acid (PFBS)**	375-73-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2216932--014	Anonymous	**Perfluoropentane sulfonic acid (PFPeS)**	2706-91-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2216932--014	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2216932--014	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2216932--014	Anonymous	**Perfluoropentanoic acid (PFPeA)**	2706-90-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2216932--014	Anonymous	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_MW217_221213,	0089_MW220_221213,	----	----	----	21-Dec-2022	20-Dec-2022	**1**
0089_MW224_221213,	0089_MW282_221213,						
0089_MW268_221213,	0089_MW269_221213						
Clear Plastic Bottle - Natural							
0089_MW226_221213		----	----	----	28-Dec-2022	20-Dec-2022	**8**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW217_221213, 0089_MW220_221213, 0089_MW224_221213, 0089_MW282_221213, 0089_MW268_221213, 0089_MW269_221213, 0089_MW226_221213	**13-Dec-2022**	**----**	----	----	**22-Dec-2022**	27-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW217_221213, 0089_MW220_221213, 0089_MW224_221213, 0089_MW282_221213, 0089_MW268_221213, 0089_MW269_221213, 0089_MW226_221213	**13-Dec-2022**	**----**	----	----	**29-Dec-2022**	10-Jan-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW217_221213, 0089_MW220_221213, 0089_MW224_221213, 0089_MW282_221213, 0089_MW268_221213, 0089_MW269_221213, 0089_MW226_221213	**13-Dec-2022**	**----**	----	----	**29-Dec-2022**	10-Jan-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW217_221213, 0089_MW220_221213, 0089_MW224_221213, 0089_MW282_221213, 0089_MW268_221213, 0089_MW269_221213	**13-Dec-2022**	**----**	----	----	**21-Dec-2022**	20-Dec-2022	×
Clear Plastic Bottle - Natural (ED093F)							
0089_MW226_221213	**13-Dec-2022**	**----**	----	----	**28-Dec-2022**	20-Dec-2022	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW226_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW217_221213, 0089_MW220_221213, 0089_MW224_221213, 0089_MW282_221213, 0089_MW268_221213, 0089_MW269_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW226_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW217_221213, 0089_MW220_221213, 0089_MW224_221213, 0089_MW282_221213, 0089_MW268_221213, 0089_MW269_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0089_MW226_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
HDPE (no PTFE) (EP231X) 0089_MW217_221213, 0089_MW220_221213, 0089_MW224_221213, 0089_MW282_221213, 0089_MW268_221213, 0089_MW269_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_MW226_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
HDPE (no PTFE) (EP231X) 0089_MW217_221213, 0089_MW220_221213, 0089_MW224_221213, 0089_MW282_221213, 0089_MW268_221213, 0089_MW269_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_MW226_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
HDPE (no PTFE) (EP231X) 0089_MW217_221213, 0089_MW220_221213, 0089_MW224_221213, 0089_MW282_221213, 0089_MW268_221213, 0089_MW269_221213	**13-Dec-2022**	**28-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2216934

Telephone : – 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP **Client:** Stantec Australia **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: **# Samples:** **Sampler:** [redacted]

Phone: [redacted]

46321; 46329; 46330; 46304; 46303; 46320; 46344; 46302

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 13/12/22 ~ 2:00pm	Date / Time: 13/12 17:00	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 46329 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS .

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW378		13/12/2022 10:50 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
002	0089_SW317		13/12/2022 10:52 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_SW318		13/12/2022 10:58 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_SW319		13/12/2022 11:07 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
005	0089_PW374		13/12/2022 11:08 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_PW409		13/12/2022 12:49 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_SW410		13/12/2022 12:51 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: 46329 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW378	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_SW317	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_SW318	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW319	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW374	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW409	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_SW410	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 46329 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW378	Clear Plastic Bottle - Natural	500 mL	00070522143333	Green	No	
001	0089_PW378	HDPE (no PTFE)	20 mL	00350522062693	Grey	No	
001	0089_PW378	HDPE (no PTFE)	20 mL	00350522062709	Grey	No	
001	0089_PW378	HDPE (no PTFE)	20 mL	00350621016906	Grey	No	
001	0089_PW378	HDPE (no PTFE)	20 mL	00350621016654	Grey	No	
001	0089_PW378	Clear Plastic Bottle - Natural	500 mL	00070522143174	Green	No	
002	0089_SW317	HDPE (no PTFE)	20 mL	00350522062516	Grey	No	
002	0089_SW317	HDPE (no PTFE)	20 mL	00350522062583	Grey	No	
002	0089_SW317	HDPE (no PTFE)	20 mL	00350522017973	Grey	No	
003	0089_SW318	HDPE (no PTFE)	20 mL	00350522018034	Grey	No	
003	0089_SW318	Clear Plastic Bottle - Natural	500 mL	00070522143166	Green	No	
003	0089_SW318	Clear Plastic Bottle - Natural	500 mL	00070522143233	Green	No	
004	0089_SW319	HDPE (no PTFE)	20 mL	00350522062613	Grey	No	
004	0089_SW319	HDPE (no PTFE)	20 mL	00350522062510	Grey	No	
004	0089_SW319	HDPE (no PTFE)	20 mL	00350621016968	Grey	No	
004	0089_SW319	HDPE (no PTFE)	20 mL	00350621017198	Grey	No	
004	0089_SW319	Clear Plastic Bottle - Natural	500 mL	00070522143106	Green	No	
005	0089_PW374	HDPE (no PTFE)	20 mL	00350522062503	Grey	No	
005	0089_PW374	HDPE (no PTFE)	20 mL	00350522018030	Grey	No	
005	0089_PW374	HDPE (no PTFE)	20 mL	00350522043058	Grey	No	
006	0089_PW409	HDPE (no PTFE)	20 mL	00350522043072	Grey	No	
006	0089_PW409	Clear Plastic Bottle - Natural	500 mL	00070522143262	Green	No	
006	0089_PW409	Clear Plastic Bottle - Natural	500 mL	00070522143223	Green	No	
007	0089_SW410	HDPE (no PTFE)	20 mL	00350522043119	Grey	No	
007	0089_SW410	HDPE (no PTFE)	20 mL	00350522043082	Grey	No	
007	0089_SW410						

CHAIN OF CUSTODY

COC#: 46329 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free Ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

Total Bottle Count: ALS: 25, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EP2216934**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46329	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 17:00	Issue Date	: 19-Dec-2022
Client Requested Due Date	: 30-Dec-2022	Scheduled Reporting Date	: **30-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 18.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2216934-001	13-Dec-2022 10:50	0089_PW378_221213	✓	✓	✓	✓
EP2216934-002	13-Dec-2022 10:52	0089_SW317_221213	✓	✓	✓	✓
EP2216934-003	13-Dec-2022 10:58	0089_SW318_221213	✓	✓	✓	✓
EP2216934-004	13-Dec-2022 11:07	0089_SW319_221213	✓	✓	✓	✓
EP2216934-005	13-Dec-2022 11:08	0089_PW374_221213	✓	✓	✓	✓
EP2216934-006	13-Dec-2022 12:49	0089_PW409_221213	✓	✓	✓	✓
EP2216934-007	13-Dec-2022 12:51	0089_SW410_221213	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216934**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Dec-2022
C-O-C number	: 46329	Issue Date	: 30-Dec-2022 17:31
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW378_221213	0089_SW317_221213	0089_SW318_221213	0089_SW319_221213	0089_PW374_221213
			Sampling date / time	13-Dec-2022 10:50	13-Dec-2022 10:52	13-Dec-2022 10:58	13-Dec-2022 11:07	13-Dec-2022 11:08
Compound	CAS Number	LOR	Unit	EP2216934-001	EP2216934-002	EP2216934-003	EP2216934-004	EP2216934-005
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**119**	**120**	**122**	**123**	**124**
Total Alkalinity as CaCO3	----	1	mg/L	**119**	**120**	**122**	**123**	**124**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2510**	**2530**	**2510**	**2530**	**2510**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**21500**	**21100**	**20600**	**20500**	**20600**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**444**	**438**	**477**	**443**	**437**
Magnesium	7439-95-4	1	mg/L	**1420**	**1410**	**1530**	**1440**	**1430**
Sodium	7440-23-5	1	mg/L	**11600**	**11400**	**12400**	**11800**	**11600**
Potassium	7440-09-7	1	mg/L	**580**	**572**	**634**	**592**	**589**
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**661**	**650**	**636**	**633**	**636**
ø Total Cations	----	0.01	meq/L	**658**	**648**	**705**	**669**	**659**
ø Ionic Balance	----	0.01	%	**0.20**	**0.14**	**5.18**	**2.73**	**1.80**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW378_221213	0089_SW317_221213	0089_SW318_221213	0089_SW319_221213	0089_PW374_221213
				Sampling date / time	13-Dec-2022 10:50	13-Dec-2022 10:52	13-Dec-2022 10:58	13-Dec-2022 11:07	13-Dec-2022 11:08
Compound	CAS Number	LOR	Unit		EP2216934-001	EP2216934-002	EP2216934-003	EP2216934-004	EP2216934-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW378_221213	0089_SW317_221213	0089_SW318_221213	0089_SW319_221213	0089_PW374_221213
			Sampling date / time	13-Dec-2022 10:50	13-Dec-2022 10:52	13-Dec-2022 10:58	13-Dec-2022 11:07	13-Dec-2022 11:08
Compound	CAS Number	LOR	Unit	EP2216934-001	EP2216934-002	EP2216934-003	EP2216934-004	EP2216934-005
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**96.3**	**97.5**	**98.5**	**101**	**102**
13C8-PFOA	----	0.02	%	**102**	**104**	**102**	**101**	**104**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW409_221213	0089_SW410_221213	----	----	----
			Sampling date / time	13-Dec-2022 12:49	13-Dec-2022 12:51	----	----	----
Compound	CAS Number	LOR	Unit	EP2216934-006	EP2216934-007	--------	--------	--------
				Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	152	147	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	152	147	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2590	2570	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	21300	20900	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	492	451	----	----	----
Magnesium	7439-95-4	1	mg/L	1550	1430	----	----	----
Sodium	7440-23-5	1	mg/L	12700	11600	----	----	----
Potassium	7440-09-7	1	mg/L	646	594	----	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	658	646	----	----	----
ø Total Cations	----	0.01	meq/L	721	660	----	----	----
ø Ionic Balance	----	0.01	%	4.59	1.07	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW409_221213	0089_SW410_221213	----	----	----
				Sampling date / time	13-Dec-2022 12:49	13-Dec-2022 12:51	----	----	----
Compound	CAS Number	LOR	Unit		EP2216934-006	EP2216934-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW409_221213	0089_SW410_221213	----	----	----
				Sampling date / time	13-Dec-2022 12:49	13-Dec-2022 12:51	----	----	----
Compound	CAS Number	LOR	Unit		EP2216934-006	EP2216934-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.4**	**99.4**	----	----	----
13C8-PFOA	----	0.02	%		**106**	**103**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216934**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Dec-2022
C-O-C number	: 46329	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
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General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4787473)									
EP2216932-008	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	4	4	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	369	371	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	374	376	0.6	0% - 20%
EP2216932-018	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	4	127	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	381	382	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	381	386	1.4	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4787474)									
EP2216934-003	0089_SW318_221213	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	122	120	1.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	122	120	1.7	0% - 20%
EP2216973-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	123	123	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	123	123	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791359)									
EP2216933-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	33	33	0.0	0% - 20%
EP2216934-004	0089_SW319_221213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2530	2540	0.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791358)									
EP2216933-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	75	72	3.3	0% - 20%
EP2216934-004	0089_SW319_221213	ED045G: Chloride	16887-00-6	1	mg/L	20500	20500	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4781670)									
EP2216932-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	83	78	7.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	22	21	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	81	80	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
EP2216933-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	164	169	3.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	20	20	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	26	26	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4781786)									
EP2216929-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	127	127	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	305	304	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1910	1900	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	107	107	0.0	0% - 20%
EP2217224-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2890	3030	4.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1210	1270	4.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	12200	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	413	432	4.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4790398)									
EP2216934-004	0089_SW319_221213	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2216973-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4790398)									
EP2216934-004	0089_SW319_221213	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4790398) - continued									
EP2216934-004	0089_SW319_221213	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2216973-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4790398)									
EP2216934-004	0089_SW319_221213	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216973-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4790398)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4790398) - continued									
EP2216934-004	0089_SW319_221213	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216973-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4790398)									
EP2216934-004	0089_SW319_221213	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2216973-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4787473)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	101	87.8	118
				<1	200 mg/L	92.7	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 4787474)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	91.2	87.8	118
				<1	200 mg/L	90.7	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791359)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	94.5	89.9	112
				<1	500 mg/L	90.3	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791358)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	91.9	88.6	113
				<1	1000 mg/L	103	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4781670)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4781786)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	108	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790398)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	72.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	72.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	69.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	71.4	69.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790398) - continued								
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	67.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	70.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790398)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	82.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	76.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	74.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	76.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	76.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	82.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	74.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	77.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	70.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	80.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790398)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	70.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	71.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	66.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	72.3	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	71.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	70.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4790398)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	73.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	67.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	83.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	71.8	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791359)							
EP2216933-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	109	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791358)							
EP2216933-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	106	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790398)							
EP2216934-001	0089_PW378_221213	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	88.2	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	85.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	76.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	86.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	77.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	86.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790398)							
EP2216934-001	0089_PW378_221213	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	82.4	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	88.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	91.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	94.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	87.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	100	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	83.4	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	85.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	90.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	93.3	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790398)							
EP2216934-001	0089_PW378_221213	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	79.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	83.5	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	77.2	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	85.0	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.1	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	84.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4790398)							
EP2216934-001	0089_PW378_221213	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	89.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	85.8	64.0	140

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4790398) - continued							
EP2216934-001	0089_PW378_221213	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	84.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	72.4	71.4	144

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216934**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling SW/PW - JS	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
0089_PW378_221213, 0089_SW317_221213, 0089_SW318_221213, 0089_SW319_221213, 0089_PW374_221213	----	----	----	21-Dec-2022	20-Dec-2022	**1**
Clear Plastic Bottle - Natural						
0089_PW409_221213, 0089_SW410_221213	----	----	----	28-Dec-2022	20-Dec-2022	**8**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW378_221213, 0089_SW317_221213, 0089_SW318_221213, 0089_SW319_221213, 0089_PW374_221213, 0089_PW409_221213, 0089_SW410_221213	**13-Dec-2022**	**----**	----	----	**22-Dec-2022**	27-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW378_221213, 0089_SW317_221213, 0089_SW318_221213, 0089_SW319_221213, 0089_PW374_221213, 0089_PW409_221213, 0089_SW410_221213	**13-Dec-2022**	**----**	----	----	**29-Dec-2022**	10-Jan-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW378_221213, 0089_SW317_221213, 0089_SW318_221213, 0089_SW319_221213, 0089_PW374_221213, 0089_PW409_221213, 0089_SW410_221213	**13-Dec-2022**	**----**	----	----	**29-Dec-2022**	10-Jan-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW378_221213, 0089_SW317_221213, 0089_SW318_221213, 0089_SW319_221213, 0089_PW374_221213	**13-Dec-2022**	**----**	----	----	**21-Dec-2022**	20-Dec-2022	×
Clear Plastic Bottle - Natural (ED093F)							
0089_PW409_221213, 0089_SW410_221213	**13-Dec-2022**	**----**	----	----	**28-Dec-2022**	20-Dec-2022	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW378_221213, 0089_SW317_221213, 0089_SW318_221213, 0089_SW319_221213, 0089_PW374_221213, 0089_PW409_221213, 0089_SW410_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW378_221213, 0089_SW317_221213, 0089_SW318_221213, 0089_SW319_221213, 0089_PW374_221213, 0089_PW409_221213, 0089_SW410_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW378_221213, 0089_SW317_221213, 0089_SW318_221213, 0089_SW319_221213, 0089_PW374_221213, 0089_PW409_221213, 0089_SW410_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW378_221213, 0089_SW317_221213, 0089_SW318_221213, 0089_SW319_221213, 0089_PW374_221213, 0089_PW409_221213, 0089_SW410_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW378_221213, 0089_SW317_221213, 0089_SW318_221213, 0089_SW319_221213, 0089_PW374_221213, 0089_PW409_221213, 0089_SW410_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2216935

Telephone : -- 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP **Client:** Stantec Australia **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: **# Samples:** **Sampler:** [redacted]

Phone: [redacted]

46321; 46329; 46330; 46304; 46303; 46320; 46344; 46302

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 13/12/22 ~ 2:00pm	Date / Time: 13/12 17:00	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 46330 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD378		13/12/2022 10:51 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD375		13/12/2022 10:59 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD374		13/12/2022 11:09 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD409		13/12/2022 12:53 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 46330 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD378	HDPE Soil Jar	200 mL	00620322095516	Grey	No	
002	0089_SD375	HDPE Soil Jar	200 mL	00620322095513	Grey	No	
003	0089_SD374	HDPE Soil Jar	200 mL	00620322095479	Grey	No	
004	0089_SD409	HDPE Soil Jar	200 mL	00620322054385	Grey	No	

Total Bottle Count: ALS: 4, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216935**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46330	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 17:00	Issue Date	: 19-Dec-2022
Client Requested Due Date	: 30-Dec-2022	Scheduled Reporting Date	: **30-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 18.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2216935-001	13-Dec-2022 10:51	0089_SD378_221212	✓	✓
EP2216935-002	13-Dec-2022 10:59	0089_SD375_221212	✓	✓
EP2216935-003	13-Dec-2022 11:09	0089_SD374_221212	✓	✓
EP2216935-004	13-Dec-2022 12:53	0089_SD409_221212	✓	✓
EP2216935-005	13-Dec-2022 12:53	0089_SD405_221212	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216935**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 22-Dec-2022
C-O-C number	: 46330	Issue Date	: 30-Dec-2022 08:59
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD378_221212	0089_SD375_221212	0089_SD374_221212	0089_SD409_221212	0089_SD405_221212
				Sampling date / time	13-Dec-2022 10:51	13-Dec-2022 10:59	13-Dec-2022 11:09	13-Dec-2022 12:53	13-Dec-2022 12:53
					EP2216935-001	EP2216935-002	EP2216935-003	EP2216935-004	EP2216935-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**17.3**	**17.7**	**14.1**	**29.6**	**25.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD378_221212	0089_SD375_221212	0089_SD374_221212	0089_SD409_221212	0089_SD405_221212
				Sampling date / time	13-Dec-2022 10:51	13-Dec-2022 10:59	13-Dec-2022 11:09	13-Dec-2022 12:53	13-Dec-2022 12:53
Compound	CAS Number	LOR	Unit		EP2216935-001	EP2216935-002	EP2216935-003	EP2216935-004	EP2216935-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**102**	**105**	**72.0**	**84.5**	**89.5**
13C8-PFOA	----	0.0002	%		**102**	**100**	**72.5**	**81.0**	**80.0**

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216935**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 22-Dec-2022
C-O-C number	: 46330	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4788458)									
EP2216931-008	Anonymous	EA055: Moisture Content	----	0.1	%	23.9	24.2	1.3	0% - 20%
ES2245394-001	Anonymous	EA055: Moisture Content	----	0.1	%	7.8	8.2	5.3	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4788478)									
EP2216931-010	Anonymous	EA055: Moisture Content	----	0.1	%	34.9	33.9	2.9	0% - 20%
EP2217214-028	Anonymous	EA055: Moisture Content	----	0.1	%	1.6	1.7	10.2	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4788885)									
EP2216931-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0004	0.0003	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2216935-001	0089_SD378_221212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4789413)									
EP2216935-003	0089_SD374_221212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4789413) - continued									
EP2216935-003	0089_SD374_221212	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4788885)									
EP2216931-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2216935-001	0089_SD378_221212	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4789413)									
EP2216935-003	0089_SD374_221212	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4788885)									
EP2216931-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4788885) - continued									
EP2216931-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2216935-001	0089_SD378_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4789413)									
EP2216935-003	0089_SD374_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4788885)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4788885) - continued									
EP2216931-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2216935-001	0089_SD378_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4789413)									
EP2216935-003	0089_SD374_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4788885)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789413)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4788885)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	77.1	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.8	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	81.4	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789413)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	89.1	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	64.0	136

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789413) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788885)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.6	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.6	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.5	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789413)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	125	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	122	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4788885)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	95.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	95.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	85.6	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	79.2	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789413)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	99.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	105	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	100	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4788885)							
EP2216931-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	81.2	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	99.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	94.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	94.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	86.4	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	109	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789413)							
EP2216935-003	0089_SD374_221212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	93.6	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	120	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	109	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	118	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	95.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	97.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4788885)							
EP2216931-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	88.6	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	105	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	102	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	101	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	107	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	104	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	95.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	104	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	115	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	95.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	98.6	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789413)							
EP2216935-003	0089_SD374_221212	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	94.9	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	119	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	122	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	111	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	87.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	98.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	84.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	103	64.0	136

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789413) - continued							
EP2216935-003	0089_SD374_221212	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	119	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	92.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	93.9	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4788885)							
EP2216931-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	104	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	103	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	88.5	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	102	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	92.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	103	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789413)							
EP2216935-003	0089_SD374_221212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	124	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	120	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	113	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	126	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	126	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	94.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	108	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4788885)							
EP2216931-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	90.8	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	97.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	92.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	92.8	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789413)							
EP2216935-003	0089_SD374_221212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	101	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	107	65.0	137

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789413) - continued							
EP2216935-003	0089_SD374_221212	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	102	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216935**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling SD - JS	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 5
Order number	: pfas-omp/Stirling	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD378_221212, 0089_SD374_221212, 0089_SD405_221212	0089_SD375_221212, 0089_SD409_221212,	**13-Dec-2022**	**----**	----	----	**22-Dec-2022**	27-Dec-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD374_221212, 0089_SD405_221212	0089_SD409_221212,	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**28-Dec-2022**	01-Feb-2023	✓
HDPE Soil Jar (EP231X)								
0089_SD378_221212,	0089_SD375_221212	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	01-Feb-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD374_221212, 0089_SD405_221212	0089_SD409_221212,	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**28-Dec-2022**	01-Feb-2023	✓
HDPE Soil Jar (EP231X)								
0089_SD378_221212,	0089_SD375_221212	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	01-Feb-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD374_221212, 0089_SD405_221212	0089_SD409_221212,	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**28-Dec-2022**	01-Feb-2023	✓
HDPE Soil Jar (EP231X)								
0089_SD378_221212,	0089_SD375_221212	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	01-Feb-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD374_221212, 0089_SD405_221212	0089_SD409_221212,	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**28-Dec-2022**	01-Feb-2023	✓
HDPE Soil Jar (EP231X)								
0089_SD378_221212,	0089_SD375_221212	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	01-Feb-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD374_221212, 0089_SD409_221212, 0089_SD405_221212	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**28-Dec-2022**	01-Feb-2023	✓
HDPE Soil Jar (EP231X)							
0089_SD378_221212, 0089_SD375_221212	**13-Dec-2022**	**23-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	01-Feb-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	30	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2216969

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP **Client:** Stantec Australia **Project Manager:** [redacted]
Phone: [redacted]

ALS Compass COC Reference: **# Samples:** **Sampler:** [redacted]
Phone: [redacted]

46321; 46329; 46330; 46304; 46303; 46320; 46344; 46302

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 13/12/22 ~ 2:00pm	**Date / Time:** 13/12 17:00	**Date / Time:**	**Date / Time:**

CHAIN OF CUSTODY

COC#: 46344 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW406		13/12/2022 01:37 PM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
002	0089_SW408		13/12/2022 01:38 PM	WATER	ALS: 5 Non ALS: 0	No		Partial 4/8		lab QC
003	0089_QC301			WATER	ALS: 0 Non ALS: 0	No	X			
004	0089_QC302		13/12/2022 01:51 PM	WATER	ALS: 2 Non ALS: 0	No	X			
005	0089_QC303		13/12/2022 01:52 PM	WATER	ALS: 2 Non ALS: 0	No	X			
006	0089_QC401		13/12/2022 01:53 PM	WATER	ALS: 2 Non ALS: 0	No	X			
007	0089_QC402		13/12/2022 01:54 PM	WATER	ALS: 2 Non ALS: 0	No	X			
008	0089_QC403		13/12/2022 01:55 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

ALS COC#: 46344 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW406	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_SW408	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 46344 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW406	HDPE (no PTFE)	20 mL	00350522062428	Grey	No	
001	0089_SW406	HDPE (no PTFE)	20 mL	00350522062425	Grey	No	
001	0089_SW406	Clear Plastic Bottle - Natural	500 mL	00070522143259	Green	No	
002	0089_SW408	Clear Plastic Bottle - Natural	500 mL	00070522143177	Green	No	
002	0089_SW408	HDPE (no PTFE)	20 mL	00350821000194	Grey	No	
002	0089_SW408	HDPE (no PTFE)	20 mL	00350522043016	Grey	No	
002	0089_SW408	HDPE (no PTFE)	20 mL	00350522042691	Grey	No	
002	0089_SW408	HDPE (no PTFE)	20 mL	00350821000229	Grey	No	
004	0089_QC302	HDPE (no PTFE)	20 mL	00350019035000	Grey	No	
004	0089_QC302	HDPE (no PTFE)	20 mL	00350019035098	Grey	No	
005	0089_QC303	HDPE (no PTFE)	20 mL	00350019035069	Grey	No	
005	0089_QC303	HDPE (no PTFE)	20 mL	00350019034998	Grey	No	
006	0089_QC401	HDPE (no PTFE)	20 mL	00350019035142	Grey	No	
006	0089_QC401	HDPE (no PTFE)	20 mL	00350019035105	Grey	No	
007	0089_QC402	HDPE (no PTFE)	20 mL	00350019015183	Grey	No	
007	0089_QC402	HDPE (no PTFE)	20 mL	00350019012101	Grey	No	
008	0089_QC403	HDPE (no PTFE)	20 mL	00352010040441	Grey	No	
008	0089_QC403	HDPE (no PTFE)	20 mL	00352010040483	Grey	No	

Total Bottle Count: ALS: 18, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216969**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46344	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2022 17:00	Issue Date	: 20-Dec-2022
Client Requested Due Date	: 30-Dec-2022	Scheduled Reporting Date	: **30-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 18.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2216969-001	13-Dec-2022 13:37	0089_SW406_221213	✓	✓	✓	✓
EP2216969-002	13-Dec-2022 13:38	0089_SW408_221213	✓	✓	✓	✓
EP2216969-003	13-Dec-2022 13:42	0089_QC301_221213		✓		
EP2216969-004	13-Dec-2022 13:51	0089_QC302_221213		✓		
EP2216969-005	13-Dec-2022 13:52	0089_QC303_221213		✓		
EP2216969-006	13-Dec-2022 13:53	0089_QC401_221213		✓		
EP2216969-007	13-Dec-2022 13:54	0089_QC402_221213		✓		
EP2216969-008	13-Dec-2022 13:55	0089_QC403_221213		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216969**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Dec-2022
C-O-C number	: 46344	Issue Date	: 30-Dec-2022 17:32
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC301_221213	0089_QC302_221213	0089_QC303_221213	0089_QC401_221213	0089_QC402_221213
				Sampling date / time	13-Dec-2022 13:42	13-Dec-2022 13:51	13-Dec-2022 13:52	13-Dec-2022 13:53	13-Dec-2022 13:54
					EP2216969-003	EP2216969-004	EP2216969-005	EP2216969-006	EP2216969-007
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC301_221213	0089_QC302_221213	0089_QC303_221213	0089_QC401_221213	0089_QC402_221213
				Sampling date / time	13-Dec-2022 13:42	13-Dec-2022 13:51	13-Dec-2022 13:52	13-Dec-2022 13:53	13-Dec-2022 13:54
					EP2216969-003	EP2216969-004	EP2216969-005	EP2216969-006	EP2216969-007
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**107**	**100**	**109**	**106**
13C8-PFOA	----	0.02	%		**106**	**104**	**99.3**	**104**	**97.6**

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	**0089_QC403_221213**	----	----	----	----
				Sampling date / time	13-Dec-2022 13:55	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2216969-008**	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	**0089_QC403_221213**	----	----	----	----
				Sampling date / time	13-Dec-2022 13:55	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2216969-008**	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	----	----	----	----
13C8-PFOA	----	0.02	%		**102**	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_SW406_221213	0089_SW408_221213	----	----	----
			Sampling date / time	13-Dec-2022 13:37	13-Dec-2022 13:38	----	----	----
Compound	CAS Number	LOR	Unit	EP2216969-001	EP2216969-002	--------	--------	--------
				Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	129	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	125	129	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3000	2940	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	22500	22200	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	462	437	----	----	----
Magnesium	7439-95-4	1	mg/L	1440	1360	----	----	----
Sodium	7440-23-5	1	mg/L	11700	11100	----	----	----
Potassium	7440-09-7	1	mg/L	583	554	----	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	700	690	----	----	----
ø Total Cations	----	0.01	meq/L	665	631	----	----	----
ø Ionic Balance	----	0.01	%	2.51	4.49	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW406_221213	0089_SW408_221213	----	----	----
				Sampling date / time	13-Dec-2022 13:37	13-Dec-2022 13:38	----	----	----
Compound	CAS Number	LOR	Unit		EP2216969-001	EP2216969-002	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW406_221213	0089_SW408_221213	----	----	----
				Sampling date / time	13-Dec-2022 13:37	13-Dec-2022 13:38	----	----	----
Compound	CAS Number	LOR	Unit		EP2216969-001	EP2216969-002	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**103**	----	----	----
13C8-PFOA	----	0.02	%		**101**	**108**	----	----	----

Surrogate Control Limits

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216969**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Dec-2022
C-O-C number	: 46344	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
No. of samples analysed	: 8		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4787474)									
EP2216934-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	122	120	1.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	122	120	1.7	0% - 20%
EP2216973-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	123	123	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	123	123	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791361)									
EP2216969-001	0089_SW406_221213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3000	2970	0.8	0% - 20%
EP2217408-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	9	8	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4791360)									
EP2216969-001	0089_SW406_221213	ED045G: Chloride	16887-00-6	1	mg/L	22500	22400	0.4	0% - 20%
EP2217408-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	16	16	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 4781786)									
EP2216929-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	127	127	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	305	304	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1910	1900	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	107	107	0.0	0% - 20%
EP2217224-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2890	3030	4.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1210	1270	4.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	12200	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	413	432	4.4	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2216973-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2216973-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4790398) - continued									
EP2216934-004	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216973-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216973-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4790398)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4790398) - continued									
EP2216934-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2216973-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4787474)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	91.2	87.8	118
				<1	200 mg/L	90.7	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791361)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100.0	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791360)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.1	88.6	113
				<1	1000 mg/L	92.8	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4781786)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	108	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790398)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	72.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	72.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	69.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	71.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	67.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	70.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790398)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	82.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	76.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	74.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	76.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	76.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	82.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	74.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	77.2	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790398) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	70.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	80.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790398)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	70.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	71.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	66.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	72.3	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	71.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	70.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4790398)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	73.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	67.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	83.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	71.8	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791361)							
EP2216969-001	0089_SW406_221213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791360)							
EP2216969-001	0089_SW406_221213	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790398)							
EP2216934-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	88.2	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	85.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	76.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	86.0	69.0	134

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790398) - continued							
EP2216934-001	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	77.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	86.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790398)							
EP2216934-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	82.4	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	88.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	91.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	94.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	87.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	100	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	83.4	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	85.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	90.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	93.3	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790398)							
EP2216934-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	79.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	83.5	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	77.2	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	85.0	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.1	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	84.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4790398)							
EP2216934-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	89.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	85.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	84.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	72.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216969**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Dec-2022
Site	: Stirling SW/PW - MB	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 8
Order number	: pfas-omp/Stirling	No. of samples analysed	: 8

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2216969--001	0089_SW406_221213	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2216969--001	0089_SW406_221213	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_SW406_221213,	0089_SW408_221213	----	----	----	28-Dec-2022	20-Dec-2022	**8**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW406_221213,	0089_SW408_221213	**13-Dec-2022**	**----**	----	----	**22-Dec-2022**	27-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW406_221213,	0089_SW408_221213	**13-Dec-2022**	**----**	----	----	**30-Dec-2022**	10-Jan-2023	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW406_221213,	0089_SW408_221213	**13-Dec-2022**	**----**	----	----	**30-Dec-2022**	10-Jan-2023	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_SW406_221213,	0089_SW408_221213	**13-Dec-2022**	**----**	----	----	**28-Dec-2022**	20-Dec-2022	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW406_221213, 0089_SW408_221213, 0089_QC301_221213, 0089_QC302_221213, 0089_QC303_221213, 0089_QC401_221213, 0089_QC402_221213, 0089_QC403_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW406_221213, 0089_SW408_221213, 0089_QC301_221213, 0089_QC302_221213, 0089_QC303_221213, 0089_QC401_221213, 0089_QC402_221213, 0089_QC403_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW406_221213, 0089_SW408_221213, 0089_QC301_221213, 0089_QC302_221213, 0089_QC303_221213, 0089_QC401_221213, 0089_QC402_221213, 0089_QC403_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW406_221213, 0089_SW408_221213, 0089_QC301_221213, 0089_QC302_221213, 0089_QC303_221213, 0089_QC401_221213, 0089_QC402_221213, 0089_QC403_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW406_221213, 0089_SW408_221213, 0089_QC301_221213, 0089_QC302_221213, 0089_QC303_221213, 0089_QC401_221213, 0089_QC402_221213, 0089_QC403_221213	**13-Dec-2022**	**24-Dec-2022**	11-Jun-2023	✓	**30-Dec-2022**	11-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2216973

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP **Client:** Stantec Australia **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: **# Samples:** 1 Eski **Sampler:** [redacted]

COC NO: 46373, 46367, 46368 **Phone:** [redacted]

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 14/12/22 ~ 11:30am	Date / Time: 14/12 1615	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 46367 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW411		14/12/2022 08:46 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
002	0089_SW412		14/12/2022 08:48 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_PW413		14/12/2022 08:49 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_SW414		14/12/2022 08:50 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_PW415		14/12/2022 08:52 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
006	0089_SW416		14/12/2022 08:53 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 46367 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free Ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW411	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_SW412	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW413	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW414	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW415	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_SW416	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 46367 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW411	Clear Plastic Bottle - Natural	500 mL	00070522143182	Green	No	
001	0089_PW411	HDPE (no PTFE)	20 mL	00350522062484	Grey	No	
001	0089_PW411	HDPE (no PTFE)	20 mL	00350522042902	Grey	No	
001	0089_PW411	HDPE (no PTFE)	20 mL	00350621016857	Grey	No	
001	0089_PW411	HDPE (no PTFE)	20 mL	00350621016705	Grey	No	
002	0089_SW412	Clear Plastic Bottle - Natural	500 mL	00070522143361	Green	No	
002	0089_SW412	HDPE (no PTFE)	20 mL	00350522042954	Grey	No	
002	0089_SW412	HDPE (no PTFE)	20 mL	00350522042696	Grey	No	
003	0089_PW413	Clear Plastic Bottle - Natural	500 mL	00070522143065	Green	No	
003	0089_PW413	HDPE (no PTFE)	20 mL	00350522062444	Grey	No	
003	0089_PW413	HDPE (no PTFE)	20 mL	00350522062406	Grey	No	
004	0089_SW414	Clear Plastic Bottle - Natural	500 mL	00070522143201	Green	No	
004	0089_SW414	HDPE (no PTFE)	20 mL	00350522042719	Grey	No	
004	0089_SW414	HDPE (no PTFE)	20 mL	00350522042964	Grey	No	
005	0089_PW415	HDPE (no PTFE)	20 mL	00350621016892	Grey	No	
005	0089_PW415	HDPE (no PTFE)	20 mL	00350621016895	Grey	No	
005	0089_PW415	Clear Plastic Bottle - Natural	500 mL	00070522146721	Green	No	
005	0089_PW415	HDPE (no PTFE)	20 mL	00350522043120	Grey	No	
005	0089_PW415	HDPE (no PTFE)	20 mL	00350522042780	Grey	No	
006	0089_SW416	HDPE (no PTFE)	20 mL	00350621016689	Grey	No	
006	0089_SW416	HDPE (no PTFE)	20 mL	00350621016560	Grey	No	
006	0089_SW416	HDPE (no PTFE)	20 mL	00350522042791	Grey	No	
006	0089_SW416	HDPE (no PTFE)	20 mL	00350522042975	Grey	No	
006	0089_SW416	Clear Plastic Bottle - Natural	500 mL	00070522143164	Green	No	

Total Bottle Count: ALS: 24, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216973**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46367	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 14-Dec-2022 16:15	Issue Date	: 20-Dec-2022
Client Requested Due Date	: 30-Dec-2022	Scheduled Reporting Date	: **30-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 11.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2216973-001	14-Dec-2022 08:46	0089_PW411_221214	✓	✓	✓	✓
EP2216973-002	14-Dec-2022 08:48	0089_SW412_221214	✓	✓	✓	✓
EP2216973-003	14-Dec-2022 08:49	0089_PW413_221214	✓	✓	✓	✓
EP2216973-004	14-Dec-2022 08:50	0089_SW414_221214	✓	✓	✓	✓
EP2216973-005	14-Dec-2022 08:52	0089_PW415_221214	✓	✓	✓	✓
EP2216973-006	14-Dec-2022 08:53	0089_SW416_221214	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216973**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Dec-2022 16:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 21-Dec-2022
C-O-C number	: 46367	Issue Date	: 30-Dec-2022 13:22
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X: PFAS results for sample #5 confirmed by instrument QC duplicate.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW411_221214	0089_SW412_221214	0089_PW413_221214	0089_SW414_221214	0089_PW415_221214
			Sampling date / time	14-Dec-2022 08:46	14-Dec-2022 08:48	14-Dec-2022 08:49	14-Dec-2022 08:50	14-Dec-2022 08:52
Compound	CAS Number	LOR	Unit	EP2216973-001	EP2216973-002	EP2216973-003	EP2216973-004	EP2216973-005
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	115	119	116	123	161
Total Alkalinity as CaCO3	----	1	mg/L	115	119	116	123	161
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2590	2560	2560	2570	2380
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	20500	20600	20800	20500	19200
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	448	478	487	487	481
Magnesium	7439-95-4	1	mg/L	1410	1510	1540	1540	1460
Sodium	7440-23-5	1	mg/L	11400	12100	12400	12400	11600
Potassium	7440-09-7	1	mg/L	563	609	623	616	592
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	634	637	642	634	594
ø Total Cations	----	0.01	meq/L	649	690	706	706	664
ø Ionic Balance	----	0.01	%	1.10	4.01	4.74	5.36	5.52
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW411_221214	0089_SW412_221214	0089_PW413_221214	0089_SW414_221214	0089_PW415_221214
				Sampling date / time	14-Dec-2022 08:46	14-Dec-2022 08:48	14-Dec-2022 08:49	14-Dec-2022 08:50	14-Dec-2022 08:52
Compound	CAS Number	LOR	Unit		EP2216973-001	EP2216973-002	EP2216973-003	EP2216973-004	EP2216973-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW411_221214	0089_SW412_221214	0089_PW413_221214	0089_SW414_221214	0089_PW415_221214
				Sampling date / time	14-Dec-2022 08:46	14-Dec-2022 08:48	14-Dec-2022 08:49	14-Dec-2022 08:50	14-Dec-2022 08:52
Compound	CAS Number	LOR	Unit		EP2216973-001	EP2216973-002	EP2216973-003	EP2216973-004	EP2216973-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**106**	**108**	**93.8**	**95.9**
13C8-PFOA	----	0.02	%		**97.6**	**103**	**100**	**99.3**	**103**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW416_221214	----	----	----	----
				Sampling date / time	14-Dec-2022 08:53	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2216973-006	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		124	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		124	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2570	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20900	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		480	----	----	----	----
Magnesium	7439-95-4	1	mg/L		1510	----	----	----	----
Sodium	7440-23-5	1	mg/L		12100	----	----	----	----
Potassium	7440-09-7	1	mg/L		614	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		646	----	----	----	----
ø Total Cations	----	0.01	meq/L		690	----	----	----	----
ø Ionic Balance	----	0.01	%		3.35	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW416_221214	----	----	----	----
				Sampling date / time	14-Dec-2022 08:53	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2216973-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW416_221214	----	----	----	----
				Sampling date / time	14-Dec-2022 08:53	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2216973-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.5**	----	----	----	----
13C8-PFOA	----	0.02	%		**104**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216973**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 21-Dec-2022
C-O-C number	: 46367	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4787474)									
EP2216934-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	122	120	1.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	122	120	1.7	0% - 20%
EP2216973-004	0089_SW414_221214	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	123	123	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	123	123	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791359)									
EP2216933-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	33	33	0.0	0% - 20%
EP2216934-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2530	2540	0.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791358)									
EP2216933-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	75	72	3.3	0% - 20%
EP2216934-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	20500	20500	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4783909)									
EP2216973-001	0089_PW411_221214	ED093F: Calcium	7440-70-2	1	mg/L	448	463	3.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1410	1460	3.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11400	11700	2.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	563	585	3.7	0% - 20%
EP2217344-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	19	19	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	17	17	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	112	111	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	9	9	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2216973-001	0089_PW411_221214	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4790775)									
EP2216973-005	0089_PW415_221214	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.01	0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2216973-001	0089_PW411_221214	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4790398) - continued									
EP2216973-001	0089_PW411_221214	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4790775)									
EP2216973-005	0089_PW415_221214	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216973-001	0089_PW411_221214	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4790775)									
EP2216973-005	0089_PW415_221214	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2216973-001	0089_PW411_221214	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4790775)									
EP2216973-005	0089_PW415_221214	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4790398)									
EP2216934-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4790398) - continued									
EP2216973-001	0089_PW411_221214	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4790775)									
EP2216973-005	0089_PW415_221214	EP231X: Sum of PFAS	----	0.01	µg/L	0.01	0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4787474)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	91.2	87.8	118
				<1	200 mg/L	90.7	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791359)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	94.5	89.9	112
				<1	500 mg/L	90.3	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791358)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	91.9	88.6	113
				<1	1000 mg/L	103	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4783909)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.3	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790398)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	72.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	72.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	69.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	71.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	67.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	70.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790775)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	94.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	106	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	101	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790398)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	82.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	76.6	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790398) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	74.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	76.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	76.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	82.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	74.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	77.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	70.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	80.1	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790775)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	110	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	99.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	120	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	114	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	91.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	77.3	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790398)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	70.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	71.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	66.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	72.3	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	71.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	70.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790775)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	106	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	102	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	113	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	123	66.0	145

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790775) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	99.5	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	107	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	87.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4790398)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	73.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	67.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	83.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	71.8	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4790775)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	106	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	105	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	85.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791359)							
EP2216933-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	109	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791358)							
EP2216933-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	106	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790398)							
EP2216934-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	88.2	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	85.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	76.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	86.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	77.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	86.2	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790775)							
EP2216973-006	0089_SW416_221214	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	104	72.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4790775) - continued							
EP2216973-006	0089_SW416_221214	EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	115	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	105	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	120	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	113	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	103	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790398)							
EP2216934-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	82.4	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	88.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	91.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	94.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	87.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	100	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	83.4	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	85.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	90.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	93.3	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4790775)							
EP2216973-006	0089_SW416_221214	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	116	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	112	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	114	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	117	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	120	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	106	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	122	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	102	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	107	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	89.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	89.5	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790398)							
EP2216934-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	79.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	83.5	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	77.2	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	85.0	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.1	57.6	145

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790398) - continued							
EP2216934-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	84.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4790775)							
EP2216973-006	0089_SW416_221214	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	117	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	114	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	118	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	121	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	111	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	110	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	94.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4790398)							
EP2216934-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	89.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	85.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	84.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	72.4	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4790775)							
EP2216973-006	0089_SW416_221214	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	103	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	115	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	108	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	106	71.4	144

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216973**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Dec-2022
Site	: Stirling SW/PW - JS	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
0089_PW411_221214, 0089_SW412_221214, 0089_PW413_221214, 0089_SW414_221214, 0089_PW415_221214, 0089_SW416_221214	----	----	----	28-Dec-2022	21-Dec-2022	**7**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	3	36	8.33	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW411_221214, 0089_SW412_221214, 0089_PW413_221214, 0089_SW414_221214, 0089_PW415_221214, 0089_SW416_221214	**14-Dec-2022**	**----**	----	----	**22-Dec-2022**	28-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW411_221214, 0089_SW412_221214, 0089_PW413_221214, 0089_SW414_221214, 0089_PW415_221214, 0089_SW416_221214	**14-Dec-2022**	**----**	----	----	**29-Dec-2022**	11-Jan-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW411_221214, 0089_SW412_221214, 0089_PW413_221214, 0089_SW414_221214, 0089_PW415_221214, 0089_SW416_221214	**14-Dec-2022**	**----**	----	----	**29-Dec-2022**	11-Jan-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_PW411_221214, 0089_PW413_221214, 0089_PW415_221214,	0089_SW412_221214, 0089_SW414_221214, 0089_SW416_221214	**14-Dec-2022**	**----**	----	----	**28-Dec-2022**	21-Dec-2022	×
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW411_221214, 0089_PW413_221214	0089_SW412_221214,	**14-Dec-2022**	**24-Dec-2022**	12-Jun-2023	✓	**30-Dec-2022**	12-Jun-2023	✓
HDPE (no PTFE) (EP231X)								
0089_SW414_221214, 0089_SW416_221214	0089_PW415_221214,	**14-Dec-2022**	**28-Dec-2022**	12-Jun-2023	✓	**29-Dec-2022**	12-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW411_221214, 0089_PW413_221214	0089_SW412_221214,	**14-Dec-2022**	**24-Dec-2022**	12-Jun-2023	✓	**30-Dec-2022**	12-Jun-2023	✓
HDPE (no PTFE) (EP231X)								
0089_SW414_221214, 0089_SW416_221214	0089_PW415_221214,	**14-Dec-2022**	**28-Dec-2022**	12-Jun-2023	✓	**29-Dec-2022**	12-Jun-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_PW411_221214, 0089_PW413_221214	0089_SW412_221214,	**14-Dec-2022**	**24-Dec-2022**	12-Jun-2023	✓	**30-Dec-2022**	12-Jun-2023	✓
HDPE (no PTFE) (EP231X)								
0089_SW414_221214, 0089_SW416_221214	0089_PW415_221214,	**14-Dec-2022**	**28-Dec-2022**	12-Jun-2023	✓	**29-Dec-2022**	12-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW411_221214, 0089_PW413_221214	0089_SW412_221214,	**14-Dec-2022**	**24-Dec-2022**	12-Jun-2023	✓	**30-Dec-2022**	12-Jun-2023	✓
HDPE (no PTFE) (EP231X)								
0089_SW414_221214, 0089_SW416_221214	0089_PW415_221214,	**14-Dec-2022**	**28-Dec-2022**	12-Jun-2023	✓	**29-Dec-2022**	12-Jun-2023	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_PW411_221214, 0089_PW413_221214	0089_SW412_221214,	**14-Dec-2022**	**24-Dec-2022**	12-Jun-2023	✓	**30-Dec-2022**	12-Jun-2023	✓
HDPE (no PTFE) (EP231X)								
0089_SW414_221214, 0089_SW416_221214	0089_PW415_221214,	**14-Dec-2022**	**28-Dec-2022**	12-Jun-2023	✓	**29-Dec-2022**	12-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	36	**8.33**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
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ALS

Environmental Division
Perth
Work Order Reference
EP2216974

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP **Client:** Stantec Australia **Project Manager** [redacted]

Phone: [redacted])

ALS Compass COC Reference: [redacted] **# Samples:** 1 Eski **Sampler:** [redacted]

Phone: [redacted])

R
10: 46373 ; 46367 ; 46368

Turnaround Requirements: Standard [redacted] Urgent [redacted]

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 14/12/22 ~ 11:30am	Date / Time: 14/12 1615	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 46368 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD411		14/12/2022 08:55 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD413		14/12/2022 08:56 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD415		14/12/2022 08:56 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 46368 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD411	HDPE Soil Jar	200 mL	00620322095496	Grey	No	
002	0089_SD413	HDPE Soil Jar	200 mL	00620322054386	Grey	No	
003	0089_SD415	HDPE Soil Jar	200 mL	00620322095590	Grey	No	

Total Bottle Count: ALS: 3, Non ALS: 0

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216974**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46368	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 14-Dec-2022 16:15	Issue Date	: 20-Dec-2022
Client Requested Due Date	: 30-Dec-2022	Scheduled Reporting Date	: **30-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 11.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2216974-001	14-Dec-2022 08:55	0089_SD411_221214	✓	✓
EP2216974-002	14-Dec-2022 08:56	0089_SD413_221214	✓	✓
EP2216974-003	14-Dec-2022 08:56	0089_SD415_221214	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216974**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Dec-2022 16:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 22-Dec-2022
C-O-C number	: 46368	Issue Date	: 28-Dec-2022 12:08
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD411_221214	0089_SD413_221214	0089_SD415_221214	----	----
			Sampling date / time	14-Dec-2022 08:55	14-Dec-2022 08:56	14-Dec-2022 08:56	----	----
Compound	CAS Number	LOR	Unit	EP2216974-001	EP2216974-002	EP2216974-003	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**25.6**	**33.8**	**25.2**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD411_221214	0089_SD413_221214	0089_SD415_221214	----	----
				Sampling date / time	14-Dec-2022 08:55	14-Dec-2022 08:56	14-Dec-2022 08:56	----	----
Compound	CAS Number	LOR	Unit		EP2216974-001	EP2216974-002	EP2216974-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		87.0	83.0	82.0	----	----
13C8-PFOA	----	0.0002	%		86.5	83.0	79.0	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216974**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 22-Dec-2022
C-O-C number	: 46368	Issue Date	: 28-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4788478)									
EP2216931-010	Anonymous	EA055: Moisture Content	----	0.1	%	34.9	33.9	2.9	0% - 20%
EP2217214-028	Anonymous	EA055: Moisture Content	----	0.1	%	1.6	1.7	10.2	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4789413)									
EP2216935-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4789413)									
EP2216935-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4789413)									
EP2216935-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4789413) - continued									
EP2216935-003	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4789413)									
EP2216935-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789413)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789413)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	89.1	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789413)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	125	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	122	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789413)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	99.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	105	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789413) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	100	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4789413)							
EP2216935-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	93.6	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	120	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	109	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	118	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	95.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	97.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4789413)							
EP2216935-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	94.9	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	119	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	122	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	111	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	87.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	98.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	84.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	103	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	119	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	92.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	93.9	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789413)							
EP2216935-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	124	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	120	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	113	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	126	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	126	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	94.4	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4789413) - continued							
EP2216935-003	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	108	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4789413)							
EP2216935-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	101	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	107	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	102	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216974**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Dec-2022
Site	: Stirling SD - JS	Issue Date	: 28-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 3
Order number	: pfas-omp/Stirling	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD411_221214, 0089_SD413_221214, 0089_SD415_221214	**14-Dec-2022**	**----**	----	----	**22-Dec-2022**	28-Dec-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD411_221214, 0089_SD413_221214, 0089_SD415_221214	**14-Dec-2022**	**23-Dec-2022**	12-Jun-2023	✓	**28-Dec-2022**	01-Feb-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD411_221214, 0089_SD413_221214, 0089_SD415_221214	**14-Dec-2022**	**23-Dec-2022**	12-Jun-2023	✓	**28-Dec-2022**	01-Feb-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD411_221214, 0089_SD413_221214, 0089_SD415_221214	**14-Dec-2022**	**23-Dec-2022**	12-Jun-2023	✓	**28-Dec-2022**	01-Feb-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD411_221214, 0089_SD413_221214, 0089_SD415_221214	**14-Dec-2022**	**23-Dec-2022**	12-Jun-2023	✓	**28-Dec-2022**	01-Feb-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD411_221214, 0089_SD413_221214, 0089_SD415_221214	**14-Dec-2022**	**23-Dec-2022**	12-Jun-2023	✓	**28-Dec-2022**	01-Feb-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2216975

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP **Client:** Stantec Australia **Project Manager:** [redacted]

Phone: ( )

ALS Compass COC Reference: **# Samples:** 1 Eski **Sampler:** [redacted]

COC NO: 46373 ; 46367 ; 46368 **Phone:** ( )

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 14/12/22 ~ 11:30am	Date / Time: 14/12 1615	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 46373 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_QC301		14/12/2022 10:03 AM	WATER	ALS: 2 Non ALS: 0	No	X		
002	0089_QC401		14/12/2022 10:04 AM	WATER	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 46373 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_QC301	HDPE (no PTFE)	20 mL	00350019041091	Grey	No	
001	0089_QC301	HDPE (no PTFE)	20 mL	00350019041310	Grey	No	
002	0089_QC401	HDPE (no PTFE)	20 mL	00350019012152	Grey	No	
002	0089_QC401	HDPE (no PTFE)	20 mL	00350019012064	Grey	No	

Total Bottle Count: ALS: 4, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2216975**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 46373	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 14-Dec-2022 16:15	Issue Date	: 20-Dec-2022
Client Requested Due Date	: 30-Dec-2022	Scheduled Reporting Date	: **30-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 11.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)
EP2216975-001	14-Dec-2022 10:03	0089_QC301_221214	✓
EP2216975-002	14-Dec-2022 10:04	0089_QC401_221214	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2216975**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Dec-2022 16:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 21-Dec-2022
C-O-C number	: 46373	Issue Date	: 30-Dec-2022 10:57
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 2		
No. of samples analysed	: 2		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	0089_QC301_221214	0089_QC401_221214	----	----	----
				Sampling date / time	14-Dec-2022 10:03	14-Dec-2022 10:04	----	----	----
Compound	CAS Number	LOR	Unit		EP2216975-001	EP2216975-002	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_221214	0089_QC401_221214	----	----	----
				Sampling date / time	14-Dec-2022 10:03	14-Dec-2022 10:04	----	----	----
Compound	CAS Number	LOR	Unit		EP2216975-001	EP2216975-002	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.8**	**97.0**	----	----	----
13C8-PFOA	----	0.02	%		**95.9**	**100**	----	----	----

Surrogate Control Limits

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2216975**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 21-Dec-2022
C-O-C number	: 46373	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 2		
No. of samples analysed	: 2		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4792246)									
ES2245791-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4792246)									
ES2245791-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4792246)									
ES2245791-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4792246) - continued									
ES2245791-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4792246)									
ES2245791-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4792246)									
ES2245791-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4792246)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	90.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	99.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	88.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	82.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	78.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	85.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4792246)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	85.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	90.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	109	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	96.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4792246)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	85.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	81.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	73.4	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	93.9	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.6	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	87.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	85.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4792246)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	90.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	91.2	67.0	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4792246) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	79.6	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4792246)							
ES2245791-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	87.4	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	98.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	84.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	80.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	75.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	71.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4792246)							
ES2245791-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	77.9	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	83.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	84.8	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	86.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	81.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	95.8	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	82.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	86.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	87.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	87.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	89.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4792246)							
ES2245791-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	70.4	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	83.2	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	86.2	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	97.3	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	88.4	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	89.8	65.0	136

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4792246) - continued							
ES2245791-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	71.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4792246)							
ES2245791-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	82.0	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	107	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	93.4	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	81.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2216975**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Dec-2022
Site	: Stirling GW - JS	Issue Date	: 30-Dec-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 2
Order number	: pfas-omp/Stirling	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC301_221214, 0089_QC401_221214	**14-Dec-2022**	**28-Dec-2022**	12-Jun-2023	✓	**30-Dec-2022**	12-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC301_221214, 0089_QC401_221214	**14-Dec-2022**	**28-Dec-2022**	12-Jun-2023	✓	**30-Dec-2022**	12-Jun-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_QC301_221214, 0089_QC401_221214	**14-Dec-2022**	**28-Dec-2022**	12-Jun-2023	✓	**30-Dec-2022**	12-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC301_221214, 0089_QC401_221214	**14-Dec-2022**	**28-Dec-2022**	12-Jun-2023	✓	**30-Dec-2022**	12-Jun-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_QC301_221214, 0089_QC401_221214	**14-Dec-2022**	**28-Dec-2022**	12-Jun-2023	✓	**30-Dec-2022**	12-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: MWHAUS - Stantec Australia Pty Ltd	TURNAROUND REQUIREMENTS : ☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: 226 Adelaide Terrace, Perth	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: WA_0089_PFASOMP	ALS QUOTE NO.: SY/139/19B / ES2022MWHAUS0002	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: pfas-omp/Stirling	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: [redacted] CONTACT PH:	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: [redacted] SAMPLER MOBILE: [redacted]	RELINQUISHED BY: [redacted]	RECEIVED BY:
COC emailed to ALS? (YES / NO) EDD FORMAT (or default): ESDAT	DATE/TIME: 13/12/2022	DATE/TIME:
Email Reports to: [redacted]	RECEIVED BY:	RELINQUISHED BY:
Email Invoice to [redacted]	DATE/TIME:	DATE/TIME:
		RECEIVED BY: 20/12 11:20 DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	NT-02 Major Anions (Chloride, Sulphate, Alkalinity)	NT-01 Major Cations (Ca, Mg, Na, K)	EN55 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F	EP231X PFAS - Full Suite (28 analytes)					
1	0089_PW306	13/12/2022	W	Surface Waters WATER	3	X	X	X	X					
2	0089_PW307	13/12/2022	W	Surface Waters WATER	3	X	X	X	X					
3	0089_PW308	13/12/2022	W	Surface Waters WATER	3	X	X	X	X					
4	0089_SW309	13/12/2022	W	Surface Waters WATER	3	X	X	X	X					
5	0089_PW314	13/12/2022	W	Surface Waters WATER	3	X	X	X	X					
6	0089_PW315	13/12/2022	W	Surface Waters WATER	3	X	X	X	X					
7	0089_PW316	13/12/2022	W	Surface Waters WATER	3	X	X	X	X					
8	0089_PW375	13/12/2022	W	Surface Waters WATER	3	X	X	X	X					
[redacted]				TOTAL										

Environmental Division Perth
Work Order Reference
EP2217375

Telephone : ~61-8-9406 1301

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2217375**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling		
Sampler	: [redacted]		

Dates

Date Samples Received	: 20-Dec-2022 11:20	Issue Date	: 21-Dec-2022
Client Requested Due Date	: 03-Jan-2023	Scheduled Reporting Date	: **03-Jan-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 11.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2217375-001	13-Dec-2022 00:00	0089_PW306_221213	✓	✓	✓
EP2217375-002	13-Dec-2022 00:00	0089_PW307_221213	✓	✓	✓
EP2217375-003	13-Dec-2022 00:00	0089_PW308_221213	✓	✓	✓
EP2217375-004	13-Dec-2022 00:00	0089_SW309_221213	✓	✓	✓
EP2217375-005	13-Dec-2022 00:00	0089_PW314_221213	✓	✓	✓
EP2217375-006	13-Dec-2022 00:00	0089_PW315_221213	✓	✓	✓
EP2217375-007	13-Dec-2022 00:00	0089_PW316_221213	✓	✓	✓
EP2217375-008	13-Dec-2022 00:00	0089_PW375_221213	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2217375**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 20-Dec-2022 11:20
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 21-Dec-2022
C-O-C number	: ----	Issue Date	: 03-Jan-2023 13:03
Sampler	: [redacted]		
Site	: Stirling		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
No. of samples analysed	: 8		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	0089_PW306_221213	0089_PW307_221213	0089_PW308_221213	0089_SW309_221213	0089_PW314_221213
			Sampling date / time	13-Dec-2022 00:00	13-Dec-2022 00:00	13-Dec-2022 00:00	13-Dec-2022 00:00	13-Dec-2022 00:00
Compound	CAS Number	LOR	Unit	EP2217375-001	EP2217375-002	EP2217375-003	EP2217375-004	EP2217375-005
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	134	130	124	117	121
Total Alkalinity as CaCO3	----	1	mg/L	134	130	124	117	121
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3020	3130	3020	2990	3000
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	22300	22600	22400	22300	22000
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	455	468	446	447	459
Magnesium	7439-95-4	1	mg/L	1420	1480	1410	1410	1450
Sodium	7440-23-5	1	mg/L	11600	11900	11400	11400	11600
Potassium	7440-09-7	1	mg/L	574	595	563	567	585
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	695	705	697	694	685
ø Total Cations	----	0.01	meq/L	659	678	648	649	662
ø Ionic Balance	----	0.01	%	2.64	1.97	3.62	3.35	1.76
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW306_221213	0089_PW307_221213	0089_PW308_221213	0089_SW309_221213	0089_PW314_221213
				Sampling date / time	13-Dec-2022 00:00	13-Dec-2022 00:00	13-Dec-2022 00:00	13-Dec-2022 00:00	13-Dec-2022 00:00
Compound	CAS Number	LOR	Unit		EP2217375-001	EP2217375-002	EP2217375-003	EP2217375-004	EP2217375-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	0089_PW306_221213	0089_PW307_221213	0089_PW308_221213	0089_SW309_221213	0089_PW314_221213
			Sampling date / time	13-Dec-2022 00:00	13-Dec-2022 00:00	13-Dec-2022 00:00	13-Dec-2022 00:00	13-Dec-2022 00:00
Compound	CAS Number	LOR	Unit	EP2217375-001	EP2217375-002	EP2217375-003	EP2217375-004	EP2217375-005
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**97.4**	**104**	**100**	**103**	**100**
13C8-PFOA	----	0.02	%	**97.1**	**97.4**	**98.1**	**93.3**	**96.1**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	0089_PW315_221213	0089_PW316_221213	0089_PW375_221213	----	----
			Sampling date / time	13-Dec-2022 00:00	13-Dec-2022 00:00	13-Dec-2022 00:00	----	----
Compound	CAS Number	LOR	Unit	EP2217375-006	EP2217375-007	EP2217375-008	--------	--------
				Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	128	130	116	----	----
Total Alkalinity as CaCO3	----	1	mg/L	128	130	116	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3020	3010	3030	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	22500	22400	21800	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	481	445	451	----	----
Magnesium	7439-95-4	1	mg/L	1520	1410	1430	----	----
Sodium	7440-23-5	1	mg/L	12200	11300	11500	----	----
Potassium	7440-09-7	1	mg/L	613	567	572	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	700	697	680	----	----
ø Total Cations	----	0.01	meq/L	695	644	655	----	----
ø Ionic Balance	----	0.01	%	0.34	3.94	1.90	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW315_221213	0089_PW316_221213	0089_PW375_221213	----	----
				Sampling date / time	13-Dec-2022 00:00	13-Dec-2022 00:00	13-Dec-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		EP2217375-006	EP2217375-007	EP2217375-008	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW315_221213	0089_PW316_221213	0089_PW375_221213	----	----
				Sampling date / time	13-Dec-2022 00:00	13-Dec-2022 00:00	13-Dec-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		EP2217375-006	EP2217375-007	EP2217375-008	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.3**	**97.8**	**108**	----	----
13C8-PFOA	----	0.02	%		**96.1**	**95.5**	**97.1**	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2217375**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 20-Dec-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 21-Dec-2022
C-O-C number	: ----	Issue Date	: 03-Jan-2023
Sampler	: [redacted]		
Site	: Stirling		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4787475)									
EP2217206-010	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	6	138	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1000	1010	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1000	1010	0.8	0% - 20%
EP2217375-005	0089_PW314_221213	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	121	124	2.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	121	124	2.1	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4791365)									
EP2217117-009	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1860	1940	4.4	0% - 20%
EP2217375-002	0089_PW307_221213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3130	3060	2.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4791366)									
EP2217117-009	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	3150	3130	0.5	0% - 20%
EP2217375-002	0089_PW307_221213	ED045G: Chloride	16887-00-6	1	mg/L	22600	22000	2.6	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4784487)									
EP2217375-001	0089_PW306_221213	ED093F: Calcium	7440-70-2	1	mg/L	455	452	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1420	1420	0.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11600	11400	1.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	574	573	0.3	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4792248)									
ES2245927-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.33	0.31	6.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.29	0.28	4.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.07	0.06	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4792248) - continued									
ES2245927-001	Anonymous	EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.05	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ES2245684-029	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.06	0.10	49.4	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4792248)									
ES2245927-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.07	0.07	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.13	0.13	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
ES2245684-029	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4792248)									
ES2245927-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4792248) - continued									
ES2245927-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2245684-029	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4792248)									
ES2245927-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2245684-029	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4792248)									
ES2245927-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	1.00	0.95	5.1	0% - 20%
ES2245684-029	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.06	0.10	50.0	0% - 50%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4787475)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	103	87.8	118
				<1	200 mg/L	88.5	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791365)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	89.9	112
				<1	500 mg/L	103	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4791366)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	107	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4784487)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	107	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.0	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4792248)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	93.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	122	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	106	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	108	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	100	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	92.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4792248)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	108	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	116	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	115	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	110	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	107	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	110	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4792248) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	116	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4792248)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	115	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	120	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	108	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	127	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	113	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4792248)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	114	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	111	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	116	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	94.6	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4791365)							
EP2217117-009	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4791366)							
EP2217117-009	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	83.7	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4792248)							
ES2245927-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	93.0	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	118	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	97.0	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	107	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	100	65.0	140

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4792248) - continued							
ES2245927-001	Anonymous	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	105	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4792248)							
ES2245927-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	110	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	117	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	97.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	111	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	108	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	116	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	114	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	118	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	124	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	105	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	113	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4792248)							
ES2245927-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	124	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	99.0	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	92.8	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	121	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	132	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	123	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	123	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4792248)							
ES2245927-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	115	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	113	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	118	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	98.0	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2217375**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 20-Dec-2022
Site	: Stirling	Issue Date	: 03-Jan-2023
Sampler	: [redacted]	No. of samples received	: 8
Order number	: pfas-omp/Stirling	No. of samples analysed	: 8

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2217117--009	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_PW306_221213,	0089_PW307_221213,	----	----	----	28-Dec-2022	20-Dec-2022	**8**
0089_PW308_221213,	0089_SW309_221213,						
0089_PW314_221213,	0089_PW315_221213,						
0089_PW316_221213,	0089_PW375_221213						

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW306_221213,	0089_PW307_221213,	**13-Dec-2022**	**----**	----	----	**22-Dec-2022**	27-Dec-2022	✓
0089_PW308_221213,	0089_SW309_221213,							
0089_PW314_221213,	0089_PW315_221213,							
0089_PW316_221213,	0089_PW375_221213							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_PW306_221213,	0089_PW307_221213,	**13-Dec-2022**	**----**	----	----	**29-Dec-2022**	10-Jan-2023	✓
0089_PW308_221213,	0089_SW309_221213,							
0089_PW314_221213,	0089_PW315_221213,							
0089_PW316_221213,	0089_PW375_221213							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW306_221213, 0089_PW307_221213, 0089_PW308_221213, 0089_SW309_221213, 0089_PW314_221213, 0089_PW315_221213, 0089_PW316_221213, 0089_PW375_221213	**13-Dec-2022**	**----**	----	----	**29-Dec-2022**	10-Jan-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW306_221213, 0089_PW307_221213, 0089_PW308_221213, 0089_SW309_221213, 0089_PW314_221213, 0089_PW315_221213, 0089_PW316_221213, 0089_PW375_221213	**13-Dec-2022**	**----**	----	----	**28-Dec-2022**	20-Dec-2022	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW306_221213, 0089_PW307_221213, 0089_PW308_221213, 0089_SW309_221213, 0089_PW314_221213, 0089_PW315_221213, 0089_PW316_221213, 0089_PW375_221213	**13-Dec-2022**	**29-Dec-2022**	11-Jun-2023	✓	**03-Jan-2023**	11-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW306_221213, 0089_PW307_221213, 0089_PW308_221213, 0089_SW309_221213, 0089_PW314_221213, 0089_PW315_221213, 0089_PW316_221213, 0089_PW375_221213	**13-Dec-2022**	**29-Dec-2022**	11-Jun-2023	✓	**03-Jan-2023**	11-Jun-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW306_221213, 0089_PW307_221213, 0089_PW308_221213, 0089_SW309_221213, 0089_PW314_221213, 0089_PW315_221213, 0089_PW316_221213, 0089_PW375_221213	**13-Dec-2022**	**29-Dec-2022**	11-Jun-2023	✓	**03-Jan-2023**	11-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW306_221213, 0089_PW307_221213, 0089_PW308_221213, 0089_SW309_221213, 0089_PW314_221213, 0089_PW315_221213, 0089_PW316_221213, 0089_PW375_221213	**13-Dec-2022**	**29-Dec-2022**	11-Jun-2023	✓	**03-Jan-2023**	11-Jun-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW306_221213, 0089_PW307_221213, 0089_PW308_221213, 0089_SW309_221213, 0089_PW314_221213, 0089_PW315_221213, 0089_PW316_221213, 0089_PW375_221213	**13-Dec-2022**	**29-Dec-2022**	11-Jun-2023	✓	**03-Jan-2023**	11-Jun-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

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Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Stantec Australia	Contact Name : [redacted]	Purchase Order : 304700525/730	COC Number : 304700525/730 -01
Office Address : 11 Harvest Terrace, West perth, WA, 6005		PROJECT Number : WA_0089_PFASOMP	Eurofins | mgt quote ID :
	Email for COC/SRN/Results : [redacted]	PROJECT Name : WA_0089_PFASOMP	Data output format: PDF; ESDAT

Special Directions & Comments :
Please send ESdat files to [redacted] with the project No in the header file

Please send invoice to
[redacted]

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	PFAS (28 analytes)
1	0089_QC201_221212	12/12/2022	Water	X
2	0089_QC202_221212	12/12/2022	Soil	X
3	0089_QC203_221212	12/12/2022	Water	X
4	0089_QC204_221212	12/12/2022	Water	X
5	0089_QC205_221212	12/12/2022	Water	X
6	0089_QC206_221212	12/12/2022	Soil	X
7	0089_QC207_221212	12/12/2022	Water	X
8	0089_QC208_221212	12/12/2022	Water	X
9	0089_QC209_221212	12/12/2022	Water	X
10	0089_QC210_221212	12/12/2022	Soil	X
11	0089_QC211_221212	12/12/2022	Water	X
12	0089_QC212_221212	12/12/2022	Water	X
13	0089_QC213_221212	12/12/2022	Water	X
14	0089_QC214_221212	12/12/2022	Water	X
15	0089_QC215_221212	12/12/2022	Water	X
16	0089_QC216_221212	12/12/2022	Water	X
17	0089_QC217_221212	12/12/2022	Soil	X
18	0089_QC218_221212	12/12/2022	Water	X

Analytes

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	

Sample comments:

Laboratory Staff

Relinquished By: Stantec Australia	Received By: [redacted]
Date & Time : 13/12/2022	Date & Time : 13/12/22 14:30
Signature:	Signature: [redacted]

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
STANDARD ☑ Other:

Method Of Shipment

☑ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 13.4

Report number: 950091

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Rolleston,
Christchurch 7675
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IANZ# 1290

Sample Receipt Advice

Company name:	Stantec Australia Pty Ltd (WA)
Contact name:	[redacted]
Project name:	WA_0089_PFASOMP
Project ID:	WA_0089_PFASOMP
Turnaround time:	7 Day
Date/Time received	Dec 13, 2022 2:30 PM
Eurofins reference	950091

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted] **on phone : or by email:** [redacted]

Results will be delivered electronically via email to [redacted] - [redacted]

Note: A copy of these results will also be delivered to the general Stantec Australia Pty Ltd (WA) email address.

Global Leader - Results you can trust

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email: EnviroSales@eurofins.com

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0089_PFASOMP
Project ID: WA_0089_PFASOMP

Order No.: 304700525/730
Report #: 950091
Phone: [redacted]
Fax:

Received: Dec 13, 2022 2:30 PM
Due: Dec 22, 2022
Priority: 7 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	PFAS (Full Suite) Water Low	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	0089_QC201_221212	Dec 12, 2022		Water	L22-De0031477		X	
2	0089_QC202_221212	Dec 12, 2022		Soil	L22-De0031478	X		X
3	0089_QC203_221212	Dec 12, 2022		Water	L22-De0031479		X	
4	0089_QC204_221212	Dec 12, 2022		Water	L22-De0031480		X	
5	0089_QC205_221212	Dec 12, 2022		Water	L22-De0031481		X	
6	0089_QC206_221212	Dec 12, 2022		Soil	L22-De0031482	X		X
7	0089_QC207_221212	Dec 12, 2022		Water	L22-De0031483		X	
8	0089_QC208_221212	Dec 12, 2022		Water	L22-De0031484		X	

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0089_PFASOMP
Project ID: WA_0089_PFASOMP

Order No.: 304700525/730
Report #: 950091
Phone: [redacted]
Fax:

Received: Dec 13, 2022 2:30 PM
Due: Dec 22, 2022
Priority: 7 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	PFAS (Full Suite) Water Low	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
External Laboratory								
9	0089_QC209_221212	Dec 12, 2022		Water	L22-De0031485		X	
10	0089_QC210_221212	Dec 12, 2022		Soil	L22-De0031486	X		X
11	0089_QC211_221212	Dec 12, 2022		Water	L22-De0031487		X	
12	0089_QC212_221212	Dec 12, 2022		Water	L22-De0031488		X	
13	0089_QC213_221212	Dec 12, 2022		Water	L22-De0031489		X	
14	0089_QC214_221212	Dec 12, 2022		Water	L22-De0031490		X	
15	0089_QC215_221212	Dec 12, 2022		Water	L22-De0031491		X	
16	0089_QC216_221212	Dec 12, 2022		Water	L22-De0031492		X	
17	0089_QC217_221212	Dec 12, 2022		Soil	L22-De0031493	X		X

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0089_PFASOMP
Project ID: WA_0089_PFASOMP

Order No.: 304700525/730
Report #: 950091
Phone: [redacted]
Fax:

Received: Dec 13, 2022 2:30 PM
Due: Dec 22, 2022
Priority: 7 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	PFAS (Full Suite) Water Low	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
External Laboratory								
18	0089_QC218_221212	Dec 12, 2022		Water	L22-De0031494		X	
Test Counts						4	14	4

Stantec Australia Pty Limited
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WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **950091-S**
Project name WA_0089_PFASOMP
Project ID WA_0089_PFASOMP
Received Date Dec 13, 2022

Client Sample ID			**0089_QC202_221212**	**0089_QC206_221212**	**0089_QC210_221212**	**0089_QC217_221212**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L22-De0031478**	**L22-De0031482**	**L22-De0031486**	**L22-De0031493**
Date Sampled			**Dec 12, 2022**	**Dec 12, 2022**	**Dec 12, 2022**	**Dec 12, 2022**
Test/Reference	LOR	Unit				
% Moisture	1	%	34	29	35	38
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	27	24	25	28
13C5-PFPeA (surr.)	1	%	54	52	51	53
13C5-PFHxA (surr.)	1	%	57	51	55	57
13C4-PFHpA (surr.)	1	%	52	53	54	56
13C8-PFOA (surr.)	1	%	60	55	63	60
13C5-PFNA (surr.)	1	%	80	78	79	74
13C6-PFDA (surr.)	1	%	70	69	65	70
13C2-PFUnDA (surr.)	1	%	54	57	62	57
13C2-PFDoDA (surr.)	1	%	58	59	55	58
13C2-PFTeDA (surr.)	1	%	64	70	67	62
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			0089_QC202_221212	0089_QC206_221212	0089_QC210_221212	0089_QC217_221212
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-De0031478	L22-De0031482	L22-De0031486	L22-De0031493
Date Sampled			Dec 12, 2022	Dec 12, 2022	Dec 12, 2022	Dec 12, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	65	72	65	65
D3-N-MeFOSA (surr.)	1	%	108	101	107	110
D5-N-EtFOSA (surr.)	1	%	102	107	99	99
D7-N-MeFOSE (surr.)	1	%	69	74	72	65
D9-N-EtFOSE (surr.)	1	%	70	76	71	66
D5-N-EtFOSAA (surr.)	1	%	73	69	66	71
D3-N-MeFOSAA (surr.)	1	%	78	76	76	83
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	52	50	49	52
18O2-PFHxS (surr.)	1	%	54	63	60	58
13C8-PFOS (surr.)	1	%	81	91	89	94
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	42	35	40	42
13C2-6:2 FTSA (surr.)	1	%	63	52	67	64
13C2-8:2 FTSA (surr.)	1	%	82	96	95	87
13C2-10:2 FTSA (surr.)	1	%	70	74	73	73
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Welshpool	Dec 14, 2022	14 Days
- Method: ARL135 Moisture in Solids			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Dec 19, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Dec 19, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Dec 19, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Dec 19, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Dec 15, 2022	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
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WA 6000

Project Name: WA_0089_PFASOMP
Project ID: WA_0089_PFASOMP

Order No.: 304700525/730
Report #: 950091
Phone: [redacted]
Fax:

Received: Dec 13, 2022 2:30 PM
Due: Dec 20, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	
Melbourne Laboratory - NATA # 1261 Site # 1254							X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_221212	Dec 12, 2022		Water	L22-De0031477		X
2	0089_QC202_221212	Dec 12, 2022		Soil	L22-De0031478	X	X
3	0089_QC203_221212	Dec 12, 2022		Water	L22-De0031479		X
4	0089_QC204_221212	Dec 12, 2022		Water	L22-De0031480		X
5	0089_QC205_221212	Dec 12, 2022		Water	L22-De0031481		X
6	0089_QC206_221212	Dec 12, 2022		Soil	L22-De0031482	X	X
7	0089_QC207_221212	Dec 12, 2022		Water	L22-De0031483		X

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Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	
Melbourne Laboratory - NATA # 1261 Site # 1254							X
External Laboratory							
8	0089_QC208_221212	Dec 12, 2022		Water	L22-De0031484		X
9	0089_QC209_221212	Dec 12, 2022		Water	L22-De0031485		X
10	0089_QC210_221212	Dec 12, 2022		Soil	L22-De0031486	X	X
11	0089_QC211_221212	Dec 12, 2022		Water	L22-De0031487		X
12	0089_QC212_221212	Dec 12, 2022		Water	L22-De0031488		X
13	0089_QC213_221212	Dec 12, 2022		Water	L22-De0031489		X
14	0089_QC214_221212	Dec 12, 2022		Water	L22-De0031490		X
15	0089_QC215_221212	Dec 12, 2022		Water	L22-De0031491		X

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Received: Dec 13, 2022 2:30 PM
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Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	
Melbourne Laboratory - NATA # 1261 Site # 1254							X
External Laboratory							
16	0089_QC216_221212	Dec 12, 2022		Water	L22-De0031492		X
17	0089_QC217_221212	Dec 12, 2022		Soil	L22-De0031493	X	X
18	0089_QC218_221212	Dec 12, 2022		Water	L22-De0031494		X
Test Counts						4	18

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	59			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	58			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	59			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	56			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	57			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	58			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	66			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	67			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	60			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	50			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	61			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	62			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	62			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	65			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	67			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	66			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	59			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	66			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	56			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	72			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	58			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	53			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	56			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	91			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	65			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	65			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	59			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	63			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	60			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	73			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M22-De0035257	NCP	%	77			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M22-De0035257	NCP	%	74			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M22-De0035257	NCP	%	76			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M22-De0035257	NCP	%	70			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M22-De0035257	NCP	%	79			50-150	Pass	
Perfluorononanoic acid (PFNA)	M22-De0035257	NCP	%	76			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M22-De0035257	NCP	%	78			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M22-De0035257	NCP	%	83			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M22-De0035257	NCP	%	79			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M22-De0035257	NCP	%	65			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M22-De0035257	NCP	%	78			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M22-De0035257	NCP	%	89			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M22-De0035257	NCP	%	90			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M22-De0035257	NCP	%	79			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M22-De0035257	NCP	%	89			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M22-De0035257	NCP	%	84			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M22-De0035257	NCP	%	82			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M22-De0035257	NCP	%	85			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M22-De0035257	NCP	%	68			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M22-De0035257	NCP	%	83			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M22-De0035257	NCP	%	73			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M22-De0035257	NCP	%	76			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M22-De0035257	NCP	%	80			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M22-De0035257	NCP	%	109			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M22-De0035257	NCP	%	70			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M22-De0035257	NCP	%	70			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M22-De0035257	NCP	%	73			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M22-De0035257	NCP	%	77			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M22-De0035257	NCP	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M22-De0035257	NCP	%	81			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M22-De0039860	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M22-De0039860	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M22-De0039860	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M22-De0039860	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	L22-De0031482	CP	%	29	31	8.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS
[redacted] Senior Analyst-Sample Properties

[redacted]

[redacted]

Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Stantec Australia Pty Limited
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Perth
WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
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Attention: [redacted]

Report **950091-W**
Project name WA_0089_PFASOMP
Project ID WA_0089_PFASOMP
Received Date Dec 13, 2022

Client Sample ID			**0089_QC201_221212**	**0089_QC203_221212**	**0089_QC204_221212**	**0089_QC205_221212**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L22-De0031477**	**L22-De0031479**	**L22-De0031480**	**L22-De0031481**
Date Sampled			**Dec 12, 2022**	**Dec 12, 2022**	**Dec 12, 2022**	**Dec 12, 2022**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	0.22	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.58	0.03	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	[N09]6.4	[N09]0.21	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]0.31	[N09]0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]1.2	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	[N09]0.04	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.25	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	75	82	62	70
13C5-PFPeA (surr.)	1	%	63	81	86	89
13C5-PFHxA (surr.)	1	%	115	100	116	116
13C4-PFHpA (surr.)	1	%	62	77	80	77
13C8-PFOA (surr.)	1	%	97	88	89	85
13C5-PFNA (surr.)	1	%	67	79	73	72
13C6-PFDA (surr.)	1	%	104	84	71	73
13C2-PFUnDA (surr.)	1	%	76	65	56	59
13C2-PFDoDA (surr.)	1	%	65	56	51	48
13C2-PFTeDA (surr.)	1	%	70	59	65	57
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	94	97	87	86
D3-N-MeFOSA (surr.)	1	%	100	96	94	81

Client Sample ID			0089_QC201_221212	0089_QC203_221212	0089_QC204_221212	0089_QC205_221212
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-De0031477	L22-De0031479	L22-De0031480	L22-De0031481
Date Sampled			Dec 12, 2022	Dec 12, 2022	Dec 12, 2022	Dec 12, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	98	88	94	75
D7-N-MeFOSE (surr.)	1	%	69	60	53	55
D9-N-EtFOSE (surr.)	1	%	75	64	60	55
D5-N-EtFOSAA (surr.)	1	%	74	65	54	52
D3-N-MeFOSAA (surr.)	1	%	87	77	65	70
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.45	0.15	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	0.22	0.05	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]0.60	[N09]0.15	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]13	[N09]0.61	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]0.78	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]91	< 0.01	[N09]0.02	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	55	94	97	97
18O2-PFHxS (surr.)	1	%	95	80	81	76
13C8-PFOS (surr.)	1	%	100	75	63	66
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	63	84	88	95
13C2-6:2 FTSA (surr.)	1	%	57	70	68	68
13C2-8:2 FTSA (surr.)	1	%	57	75	66	69
13C2-10:2 FTSA (surr.)	1	%	83	71	61	63
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	104	0.61	0.02	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	92.2	< 0.01	0.02	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	105.2	0.61	0.02	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	113.16	1.01	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	114.8	1.21	< 0.1	< 0.1

Client Sample ID			0089_QC207_221212	0089_QC208_221212	0089_QC209_221212	0089_QC211_221212
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-De0031483	L22-De0031484	L22-De0031485	L22-De0031487
Date Sampled			Dec 12, 2022	Dec 12, 2022	Dec 12, 2022	Dec 12, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			0089_QC207_221212	0089_QC208_221212	0089_QC209_221212	0089_QC211_221212
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-De0031483	L22-De0031484	L22-De0031485	L22-De0031487
Date Sampled			Dec 12, 2022	Dec 12, 2022	Dec 12, 2022	Dec 12, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	80	94	66	77
13C5-PFPeA (surr.)	1	%	97	86	98	87
13C5-PFHxA (surr.)	1	%	131	105	133	114
13C4-PFHpA (surr.)	1	%	98	70	104	90
13C8-PFOA (surr.)	1	%	108	84	111	96
13C5-PFNA (surr.)	1	%	91	81	91	80
13C6-PFDA (surr.)	1	%	97	100	96	83
13C2-PFUnDA (surr.)	1	%	77	92	81	69
13C2-PFDoDA (surr.)	1	%	65	86	69	59
13C2-PFTeDA (surr.)	1	%	76	89	77	60
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	106	109	105	92
D3-N-MeFOSA (surr.)	1	%	107	123	109	84
D5-N-EtFOSA (surr.)	1	%	104	132	111	84
D7-N-MeFOSE (surr.)	1	%	62	87	69	54
D9-N-EtFOSE (surr.)	1	%	70	93	74	63
D5-N-EtFOSAA (surr.)	1	%	72	83	81	66
D3-N-MeFOSAA (surr.)	1	%	97	96	91	79
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	101	94	107	94
18O2-PFHxS (surr.)	1	%	91	76	95	87
13C8-PFOS (surr.)	1	%	84	85	79	69

Client Sample ID			0089_QC207_221212	0089_QC208_221212	0089_QC209_221212	0089_QC211_221212
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-De0031483	L22-De0031484	L22-De0031485	L22-De0031487
Date Sampled			Dec 12, 2022	Dec 12, 2022	Dec 12, 2022	Dec 12, 2022
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	111	80	111	105
13C2-6:2 FTSA (surr.)	1	%	89	66	84	82
13C2-8:2 FTSA (surr.)	1	%	87	87	88	74
13C2-10:2 FTSA (surr.)	1	%	84	107	93	74
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			0089_QC212_221212	0089_QC213_221212	0089_QC214_221212	0089_QC215_221212
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-De0031488	L22-De0031489	L22-De0031490	L22-De0031491
Date Sampled			Dec 12, 2022	Dec 12, 2022	Dec 12, 2022	Dec 12, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]0.02	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	62	67	84	87
13C5-PFPeA (surr.)	1	%	97	76	74	73
13C5-PFHxA (surr.)	1	%	121	96	81	98
13C4-PFHpA (surr.)	1	%	105	85	55	69
13C8-PFOA (surr.)	1	%	95	89	71	83
13C5-PFNA (surr.)	1	%	90	80	68	79
13C6-PFDA (surr.)	1	%	61	56	80	97
13C2-PFUnDA (surr.)	1	%	65	60	65	84
13C2-PFDoDA (surr.)	1	%	60	55	58	78
13C2-PFTeDA (surr.)	1	%	67	69	69	69

Client Sample ID			0089_QC212_221212	0089_QC213_221212	0089_QC214_221212	0089_QC215_221212
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-De0031488	L22-De0031489	L22-De0031490	L22-De0031491
Date Sampled			Dec 12, 2022	Dec 12, 2022	Dec 12, 2022	Dec 12, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	85	76	91	98
D3-N-MeFOSA (surr.)	1	%	40	36	74	88
D5-N-EtFOSA (surr.)	1	%	34	32	73	80
D7-N-MeFOSE (surr.)	1	%	35	29	63	66
D9-N-EtFOSE (surr.)	1	%	35	32	65	74
D5-N-EtFOSAA (surr.)	1	%	25	25	53	95
D3-N-MeFOSAA (surr.)	1	%	56	53	62	88
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	0.08	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	0.02	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]0.05	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.01	< 0.01	[N09]0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	106	97	79	88
18O2-PFHxS (surr.)	1	%	99	94	61	75
13C8-PFOS (surr.)	1	%	70	61	64	77
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	68	46	76	78
13C2-6:2 FTSA (surr.)	1	%	46	38	58	65
13C2-8:2 FTSA (surr.)	1	%	25	22	68	84
13C2-10:2 FTSA (surr.)	1	%	22	20	82	111
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.01	< 0.01	0.06	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.01	< 0.01	0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.01	< 0.01	0.06	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	0.16	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	0.18	< 0.1

Client Sample ID			0089_QC216_221212	0089_QC218_221212
Sample Matrix			Water	Water
Eurofins Sample No.			L22-De0031492	L22-De0031494
Date Sampled			Dec 12, 2022	Dec 12, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	0.04
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	[N09]0.10
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	[N09]0.03
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	[N09]0.06
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	85	101
13C5-PFPeA (surr.)	1	%	95	92
13C5-PFHxA (surr.)	1	%	124	125
13C4-PFHpA (surr.)	1	%	93	101
13C8-PFOA (surr.)	1	%	102	113
13C5-PFNA (surr.)	1	%	83	94
13C6-PFDA (surr.)	1	%	89	83
13C2-PFUnDA (surr.)	1	%	72	79
13C2-PFDoDA (surr.)	1	%	59	67
13C2-PFTeDA (surr.)	1	%	58	67
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	93	104
D3-N-MeFOSA (surr.)	1	%	85	97
D5-N-EtFOSA (surr.)	1	%	81	93
D7-N-MeFOSE (surr.)	1	%	58	65
D9-N-EtFOSE (surr.)	1	%	63	71
D5-N-EtFOSAA (surr.)	1	%	66	84
D3-N-MeFOSAA (surr.)	1	%	83	95
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	0.05
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	0.02
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	[N09]0.04
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.01	[N09]0.42
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	[N09]0.09
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.27	[N09]7.1
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01

Client Sample ID			0089_QC216_221212	0089_QC218_221212
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**L22-De0031492**	**L22-De0031494**
Date Sampled			**Dec 12, 2022**	**Dec 12, 2022**
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonic acids (PFSAs)				
13C3-PFBS (surr.)	1	%	102	106
18O2-PFHxS (surr.)	1	%	92	94
13C8-PFOS (surr.)	1	%	75	81
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	0.02
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	112	130
13C2-6:2 FTSA (surr.)	1	%	84	95
13C2-8:2 FTSA (surr.)	1	%	77	95
13C2-10:2 FTSA (surr.)	1	%	76	101
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	0.28	7.52
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.27	7.16
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.28	7.58
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.28	7.82
Sum of PFASs (n=30)*	0.1	ug/L	0.28	7.98

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Dec 16, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Dec 16, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Dec 16, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Dec 16, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Dec 15, 2022	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: WA_0089_PFASOMP
Project ID: WA_0089_PFASOMP

Order No.: 304700525/730
Report #: 950091
Phone: [redacted]
Fax:

Received: Dec 13, 2022 2:30 PM
Due: Dec 20, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	
Melbourne Laboratory - NATA # 1261 Site # 1254							X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_221212	Dec 12, 2022		Water	L22-De0031477		X
2	0089_QC202_221212	Dec 12, 2022		Soil	L22-De0031478	X	X
3	0089_QC203_221212	Dec 12, 2022		Water	L22-De0031479		X
4	0089_QC204_221212	Dec 12, 2022		Water	L22-De0031480		X
5	0089_QC205_221212	Dec 12, 2022		Water	L22-De0031481		X
6	0089_QC206_221212	Dec 12, 2022		Soil	L22-De0031482	X	X
7	0089_QC207_221212	Dec 12, 2022		Water	L22-De0031483		X

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Perth
WA 6000

Project Name: WA_0089_PFASOMP
Project ID: WA_0089_PFASOMP

Order No.: 304700525/730
Report #: 950091
Phone: [redacted]
Fax:

Received: Dec 13, 2022 2:30 PM
Due: Dec 20, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	
Melbourne Laboratory - NATA # 1261 Site # 1254							X
External Laboratory							
8	0089_QC208_221212	Dec 12, 2022		Water	L22-De0031484		X
9	0089_QC209_221212	Dec 12, 2022		Water	L22-De0031485		X
10	0089_QC210_221212	Dec 12, 2022		Soil	L22-De0031486	X	X
11	0089_QC211_221212	Dec 12, 2022		Water	L22-De0031487		X
12	0089_QC212_221212	Dec 12, 2022		Water	L22-De0031488		X
13	0089_QC213_221212	Dec 12, 2022		Water	L22-De0031489		X
14	0089_QC214_221212	Dec 12, 2022		Water	L22-De0031490		X
15	0089_QC215_221212	Dec 12, 2022		Water	L22-De0031491		X

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Project Name: WA_0089_PFASOMP
Project ID: WA_0089_PFASOMP

Order No.: 304700525/730
Report #: 950091
Phone: [redacted]
Fax:

Received: Dec 13, 2022 2:30 PM
Due: Dec 20, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	
Melbourne Laboratory - NATA # 1261 Site # 1254							X
External Laboratory							
16	0089_QC216_221212	Dec 12, 2022		Water	L22-De0031492		X
17	0089_QC217_221212	Dec 12, 2022		Soil	L22-De0031493	X	X
18	0089_QC218_221212	Dec 12, 2022		Water	L22-De0031494		X
Test Counts						4	18

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	135			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	114			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	117			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	107			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	123			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	117			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	112			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	126			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	128			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	128			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	113			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	117			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	125			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	114			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	110			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	126			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	133			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	118			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	102			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	110			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	108			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	107			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	114			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	110			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	112			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	99			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	104			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	131			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	106			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L22-De0031479	CP	%	115			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L22-De0031479	CP	%	89			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L22-De0031479	CP	%	123			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-De0031479	CP	%	113			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L22-De0031479	CP	%	122			50-150	Pass	
Perfluorononanoic acid (PFNA)	L22-De0031479	CP	%	116			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L22-De0031479	CP	%	118			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-De0031479	CP	%	141			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-De0031479	CP	%	133			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-De0031479	CP	%	141			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-De0031479	CP	%	110			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L22-De0031479	CP	%	116			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-De0031479	CP	%	122			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-De0031479	CP	%	110			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L22-De0031479	CP	%	110			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L22-De0031479	CP	%	123			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-De0031479	CP	%	150			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-De0031479	CP	%	128			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L22-De0031479	CP	%	112			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-De0031479	CP	%	102			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-De0031479	CP	%	112			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-De0031479	CP	%	102			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-De0031479	CP	%	78			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-De0031479	CP	%	115			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-De0031479	CP	%	110			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-De0031479	CP	%	84			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-De0031479	CP	%	102			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L22-De0031479	CP	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-De0031479	CP	%	103			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-De0031479	CP	%	117			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M22-De0037211	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M22-De0037211	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M22-De0037211	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M22-De0037211	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M22-De0037211	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M22-De0037211	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M22-De0037211	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M22-De0037211	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M22-De0037211	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M22-De0037211	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS

[redacted]
[redacted]
Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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APPENDIX

D

FIELD RECORDS & CALIBRATION CERTIFICATES

Cardno

now

Stantec

Monitoring Date	Monitoring Location	Sample_ID	Screen Interval	TOC (mAHD)	Well Depth (m)	SWL Time	SWL (mbTOC)	RWL (mAHD)	Observations	Sampling Method Method	Temp. (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH
12/12/22	MW109	0089_MW109_221212	2.5-5.5_	4.446	5.5	13:34	4.23	0.216		HydraSleeve	20.8	2.25	813	526.5	7.47
12/12/22	MW112	0089_MW112_221212	3.0 - 6.0	3.973	6.0	13:25	3.55	0.423		HydraSleeve	22.4	1.04	533	344.5	7.64
12/12/22	MW120	0089_MW120_221212	2.5-5.5_	4.409	5.5	12:53	4.15	0.259		HydraSleeve	21.4	1.63	916	598	7.86
12/12/22	MW121	0089_MW121_221212	2.7-5.7_	3.7	5.7	13:04	3.42	0.28	Bore nearly dry	HandBailing	21.6	5.68	544	351	8
12/12/22	MW123	0089_MW123_221212	4.5-8_	6.62	8.0	12:21	6.335	0.285		HydraSleeve	22.3	1.87	2339	1521	7.8
12/12/22	MW124	0089_MW124_221212	0.75-4_	1.899	4.0	09:11	1.97	-0.071		HydraSleeve	20.5	0.3	38051	27073	6.68
12/12/22	MW125	0089_MW125_221212	0.9-3.9_	1.882	3.9	10:16	1.965	-0.083		HydraSleeve	21.6	0.77	43543	30245	7.15
12/12/22	MW126	0089_MW126_221212	0.9-3.9_	1.948	3.9	11:19	1.92	0.028		HydraSleeve	21.6	0.42	39481	27422	6.99
12/12/22	MW127	0089_MW127_221212	0.9-3.9_	1.771	3.9	12:25	1.76	0.011		HydraSleeve	21.5	0.78	39462	27473	7.24
12/12/22	MW128	0089_MW128_221212	2.5-5.5_	4.537	5.5	13:50	4.33	0.207		HandBailing	21.4	2.95	1660	1079	7.27
12/12/22	MW139	0089_MW139_221212	2-5_	2.273	5.0	09:14	2.095	0.178		HydraSleeve	20.5	3.25	1921	1241.5	7.26
12/12/22	MW141	0089_MW141_221212	2-5_	3.025	5.0	09:32	2.92	0.105		HydraSleeve	19.9	1.73	23723	15424.5	6.96
12/12/22	MW142	0089_MW142_221212	0.25-4_	2.573	4.0	10:14	2.55	0.023		HydraSleeve	20.6	0.73	33446	21742	7.35
12/12/22	MW147		2-5_	3.423	5.2	09:20			Blocked and inaccessible in dense bush						
12/12/22	MW149	0089_MW149_221212	1-4_	2.303	4.0	11:17	2.3	0.003		HydraSleeve	20.9	1.41	19444	12636	7.67
12/12/22	MW158	0089_MW158_221212	NA*	14.541	15.82	11:01	14.31	0.231		HydraSleeve	20.8	1.53	15086	9025.5	7.28
12/12/22	MW161	0089_MW161_221212	NA*	17.225	18.13	10:59	16.839	0.386		HydraSleeve	20.7	2.78	2871	1721.5	7.58
12/12/22	MW166	0089_MW166_221212	10-13_	11.89	13.0	09:51	11.422	0.468		HydraSleeve	19.9	3.26	3725	2266	7.31
12/12/22	MW171	0089_MW171_221212	28.5-31.5_	29.238	31.5	09:09	28.694	0.544		HydraSleeve	20.1	0.91	14483	8767	7.19
12/12/22	MW172	0089_MW172_221212	-0_	16.772	26.0	09:40	16.474	0.298		HydraSleeve	21.7	1.59	5819	3448.5	7.62
12/12/22	MW173	0089_MW173_221212	NA*	10.08	11.11	12:41	9.695	0.385		HydraSleeve	22.7	2.96	3335	1919.5	7.08
12/12/22	MW193	0089_MW193_221212	10.5-13.5_	11.86	13.5	11:54	11.394	0.466		HydraSleeve	20.5	1.75	2379	1430	7.23
12/12/22	MW195D	0089_MW195D_221212	10-13_	4.363	13.0	11:21	4.308	0.055		HydraSleeve	21	1.5	37788	22500.5	7.37
12/12/22	MW195S	0089_MW195S_221212	3.5-6.5_	4.571	6.5	11:44	4.26	0.311		HydraSleeve	21.4	1.37	5723	3377	7.25
13/12/22	MW196	0089_MW196_221213	NA*	12.75	13.8	08:42	12.543	0.207		HydraSleeve	17.9	7.37	925	588.5	7.41
12/12/22	MW197	0089_MW197_221212	NA*	2.28	NA*	12:51	2.305	-0.025		HydraSleeve	20.2	3.35	2990	1809.5	7.59
12/12/22	MW199	0089_MW199_221212	NA*	11.8	NA*	11:02	11.469	0.331		HydraSleeve	21.3	1.03	10542	6242.5	7.37
12/12/22	MW200	0089_MW200_221212	NA*	2.07	NA*	13:37	2.23	-0.16		HydraSleeve	20.7	2.04	7544	4521	7.54
12/12/22	MW202	0089_MW202_221212	NA*	2.12	NA*	13:31	1.98	0.14		HydraSleeve	21	1.76	1883	1326	7.56
12/12/22	MW203	0089_MW203_221212	NA*	10.855	12.9	13:08	10.54	0.315		HydraSleeve	23	3.76	990	670	7.94
13/12/22	MW214	0089_MW214_221213	5.5-9_	8.075	9.0	10:20	7.932	0.143		HydraSleeve	18.3	1.33	2886	1820.5	7.25
13/12/22	MW215	0089_MW215_221213	1.5-4.5_	3.794	4.5	10:33	3.702	0.092		HydraSleeve	18.1	1.88	1887	1199	7.6
13/12/22	MW216	0089_MW216_221213	6-9_	8.329	6.0	10:08	8.069	0.26		HydraSleeve	18	3.08	5561	3525	7.54
13/12/22	MW217	0089_MW217_221213	6.5-9.5_	8.847	9.5	08:41	8.5	0.347		HydraSleeve	19.8	5.03	1133	1084	6.84
13/12/22	MW220	0089_MW220_221213	NA*	NA*	NA*	08:53	6.68			HydraSleeve	18.7	1.23	687	508	7.25
13/12/22	MW224	0089_MW224_221213	11.25-14.25_	13.372	14.25	09:09	12.95	0.422		HydraSleeve	18.9	5.19	829	609	7.59
13/12/22	MW225	0089_MW225_221213	2-5_	4.066	5.0	10:50	4.03	0.036		HydraSleeve	17.9	3.4	2012	1281.5	7.45
13/12/22	MW226	0089_MW226_221213	0.75-3.8_	1.749	3.8	13:03	1.42	0.329		HydraSleeve	19.8	0.93	39126	28240	7.14
13/12/22	MW227	0089_MW227_221213	1.25-4.2_	2.961	4.2	12:59	2.94	0.021		HydraSleeve	19	1.95	2913	1891.5	7.55
13/12/22	MW228	0089_MW228_221213	0.75-3.75_	2.23	3.75	12:53	2.269	-0.039		HydraSleeve	18.4	3.1	17609	11038.5	7.68
13/12/22	MW233	0089_MW233_221213	NA*	3.705	4.968	10:33	3.26	0.445		HydraSleeve	15.7	1.23	414.9	269.75	8.14
13/12/22	MW236	0089_MW236_221213	NA*	4.642	5.66	11:39	4.13	0.512	Hydrasleeve didn't fill up	HandBailing	19.6	3.63	715	461.5	7.77
13/12/22	MW238	0089_MW238_221213	NA*	4.827	NA*	09:11	4.385	0.442		HydraSleeve	19.6	2.85	673	435.5	7.86
13/12/22	MW239	0089_MW239_221213	NA*	4.03	NA*	09:26	3.6	0.43	Bore under a sand stockpile, casing filling up with sand	HydraSleeve	17.3	3.29	634	409.5	7.86
13/12/22	MW240	0089_MW240_221213	NA*	4.483	6.8	09:02	4.04	0.443		HydraSleeve	19	2.22	774	500.5	7.65
13/12/22	MW242	0089_MW242_221213	NA*	3.539	4.76	08:35	3.14	0.399		HydraSleeve	20.8	1.13	497.4	322.4	7.58
13/12/22	MW243	0089_MW243_221213	NA*	4.892	7.0	08:50	4.48	0.412		HydraSleeve	19.7	2.11	929	604.5	7.6
13/12/22	MW245	0089_MW245_221213	NA*	4.551	5.65	09:39	4.15	0.401		HydraSleeve	16.6	1.62	611	396.5	7.62
13/12/22	MW249	0089_MW249_221213	3.5-6.5_	5.227	6.5	09:51	4.92	0.307		HydraSleeve	19.6	1.77	1199	1200	7.57
13/12/22	MW255	0089_MW255_221213	3-6_	4.609	6.0	12:39	4.152	0.457		HydraSleeve	19.5	1.39	929	604.5	7.73
13/12/22	MW256	0089_MW256_221213	3-6_	3.84	6.0	12:30	3.37	0.47		HydraSleeve	19.6	0.8	1683	1092	7.33
13/12/22	MW257	0089_MW257_221213	2.7-5.7_	3.806	5.7	11:51	3.39	0.416		HydraSleeve	19.8	5.07	546.7	355.55	8.02
13/12/22	MW258	0089_MW258_221213	3-6_	4.043	6.0	12:05	3.65	0.393		HydraSleeve	20.7	1.83	1360	884	7.45
13/12/22	MW259	0089_MW259_221213	2.5-5.5_	3.8	5.5	12:16	3.41	0.39		HydraSleeve	18.7	2.81	536	348.4	7.7
13/12/22	MW268	0089_MW268_221213	2.5-5.5_	4.056	5.5	10:13	4.035	0.021		HydraSleeve	20.2	0.87	10265	7361	7.21
13/12/22	MW269	0089_MW269_221213	2.5-5.5_	4.153	5.5	10:30	4.14	0.013		HydraSleeve	19.7	1.1	1181	852	7.6
13/12/22	MW282	0089_MW282_221213	4.5-7.5_	5.78	7.5	09:34	5.37	0.41		HydraSleeve	18.8	2.17	933	687	7.09
12/12/22	MW288	0089_MW288_221212	2.25-5.25_	4.003	5.25	15:07	3.76	0.243		HydraSleeve	22.7	1.47	2249	1528	7.59
13/12/22	MW289	0089_MW289_221213	3.25 - 6.25_	4.495	6.25	11:18	4.145	0.35	Bore requires a metal detector to be found.	HydraSleeve	20.6	0.48	907	591.5	7.64
13/12/22	MW496	0089_MW496_221213	3.5-8_	5.092	8.0	10:07	4.93	0.162		HydraSleeve	19.9	0.86	1394	903.5	7.7
12/12/22	MW500	0089_MW500_221212	2-6.5_	3.692	6.5	13:16	3.45	0.242		HydraSleeve	23.6	1.03	667	435.5	7.53
13/12/22	MW516	0089_MW516_221213	4.5-7.5_	6.37	7.5	10:18	6.17	0.2		HydraSleeve	19.5	2.27	1250	812.5	7.6

Notes: NA* - No bore log available

Monitoring Location	Eh (mV)	QC Dup Sample #	Odour Comments	Colour
MW109	17.2			Clear
MW112	-18.6			Clear
MW120	-13.5			Clear
MW121	7.7			Cloudy
MW123	-32.6	QC114/214		Clear
MW124	-317.3		Hydrogen sulfide	Clear
MW125	-302.7	QC103/203		Clear
MW126	-324.1		Hydrogen sulfide	Clear
MW127	-326.7	QC113/213	Hydrogen sulfide	Clear
MW128	28			Cloudy
MW139	129.8			Clear
MW141	-249.2	QC101/201		Clear
MW142	-131.5			Clear
MW147				
MW149	-7.9			Clear
MW158	27.5			Clear
MW161	-16.4			Clear
MW166	-19.2			Clear
MW171	-157.9			Clear
MW172	-195.2			Clear
MW173	44.7			Clear
MW193	22.5			Clear
MW195D	-54.9	QC111/211		Clear
MW195S	-9.5			Clear
MW196	122.5			Clear
MW197	59.1	QC115/215		Clear
MW199	4.3	QC108/208		Clear
MW200	45.4			Clear
MW202	-127.3			Clear
MW203	-169.5			Brown
MW214	-85.9			Clear
MW215	-24.7			Clear
MW216	-68.7			Clear
MW217	-15.4			Cloudy
MW220	-121.3		Organic odour	Brown
MW224	17.1			Cloudy
MW225	-1.8			Clear
MW226	-126.4			Brown
MW227	35.7			Cloudy
MW228	-84.5			Clear
MW233	23.5			Clear
MW236	79			Cloudy,Yellow
MW238	126.8			Cloudy
MW239	120.3			Cloudy
MW240	134			Cloudy
MW242	155.2			Cloudy
MW243	140.8			Cloudy
MW245	-40.3		Hydrocarbons	Cloudy,Yellow
MW249	64.1			Cloudy
MW255	75.4			Clear
MW256	79.3			Clear
MW257	74.1			Cloudy
MW258	87.2			Cloudy
MW259	75.1			Clear
MW268	-7.9			Cloudy
MW269	24.4			Clear
MW282	-17.3			Brown
MW288	-157.7			Clear
MW289	75.1			Clear
MW496	76.6			Clear
MW500	6.9			Cloudy
MW516	-62.7			Clear

log available

Monitoring Date	Monitoring Location	Sample_ID	Sampling Method	Temp. (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	QC Dup Sample #	Colour
12/12/22	PW304	0089_PW304_221212	Peristaltic Pump	22.9	0.8	16802	11380	7.52	-282		Clear
13/12/22	PW306	0089_PW306_221213	Peristaltic Pump	19.4	2.12	61177	37730	7.69	-142.9		Clear
13/12/22	PW307	0089_PW307_221213	Peristaltic Pump	19.7	1.2	65633	40205	7.82	-0.8		Clear
13/12/22	PW308	0089_PW308_221213	Peristaltic Pump	19.6	3.13	63916	39215	7.83	15.1		Clear
13/12/22	PW314	0089_PW314_221213	Peristaltic Pump	20.3	2.63	64969	39215	7.72	-66.7		Clear
13/12/22	PW315	0089_PW315_221213	Peristaltic Pump	19.8	2.77	64981	39655	7.76	-38.8		Clear
13/12/22	PW316	0089_PW316_221213	Peristaltic Pump	20.4	2.75	65154	39270	7.82	19.2		Clear
12/12/22	PW329	0089_PW329_221212	Peristaltic Pump	23	0.58	59412	38610	7.69	-251.1		Clear
12/12/22	PW330	0089_PW330_221212	Peristaltic Pump	23.1	0.48	57250	37245	7.65	-259.7	QC105/205	Clear
12/12/22	PW331	0089_PW331_221212	Peristaltic Pump	22.3	1.08	57821	37570	7.56	-272.5		Clear
12/12/22	PW335	0089_PW335_221212	Peristaltic Pump	20.5	0.77	48299	34326	7.64	-292.4		Clear
12/12/22	PW340	0089_PW340_221212	Peristaltic Pump	22.8	0.67	54245	36790	7.51	-300.1		Clear
12/12/22	PW341	0089_PW341_221212	Peristaltic Pump	22.5	0.29	52021	35510	7.63	-287.9		Clear
13/12/22	PW345	0089_PW345_221213	Peristaltic Pump	18.7	0.8	49006	30662	7.59	-252.9		Clear
12/12/22	PW346	0089_PW346_221212	Peristaltic Pump	28.8	5.5	59176	35841	8.05	-60.7	QC118/218	Clear
12/12/22	PW350	0089_PW350_221212	Peristaltic Pump	23.5	1.85	57304	37245	7.84	49.6		Clear
12/12/22	PW351	0089_PW351_221212	Peristaltic Pump	22.6	1.11	57357	37310	8	43.4		Clear
12/12/22	PW352	0089_PW352_221212	Peristaltic Pump	23	2.63	56950	36985	8.01	44.8		Clear
12/12/22	PW356	0089_PW356_221212	Peristaltic Pump	21.8	0.9	55773	36270	7.53	-233.5		Clear
12/12/22	PW357	0089_PW357_221212	Peristaltic Pump	22.1	0.89	56962	37050	7.56	-214.5		Clear
12/12/22	PW358	0089_PW358_221212	Peristaltic Pump	23.9	1.11	58987	38350	7.65	-270		Clear
12/12/22	PW362	0089_PW362_221212	Peristaltic Pump	23.2	0.54	49892	33487	7.55	-297.9	QC107/207	Clear
12/12/22	PW363	0089_PW363_221212	Peristaltic Pump	22.4	0.38	52027	35612	7.67	-311		Clear
12/12/22	PW364	0089_PW364_221212	Peristaltic Pump	21.2	0.75	52093	36529	7.55	-291.7		Clear
13/12/22	PW367	0089_PW367_221213	Peristaltic Pump	19.5	0.47	39928	24530	7.35	-268.4		Clear
12/12/22	PW368	0089_PW368_221212	Peristaltic Pump	26	0.31	42158	26867	7.37	-308.7	QC116/216	Clear
13/12/22	PW369	0089_PW369_221213	Peristaltic Pump	19.2	0.41	55563	34430	7.36	-310.4		Clear
13/12/22	PW374	0089_PW374_221213	Peristaltic Pump	20.8	8.82	52204	36928	7.96	5		Clear
13/12/22	PW375	0089_PW375_221213	Peristaltic Pump	20.3	2.97	50997	36382	7.82	16.1		Clear
13/12/22	PW378	0089_PW378_221213	Peristaltic Pump	20.1	3.5	49884	35742	7.65	-8.9		Clear
12/12/22	PW380	0089_PW380_221212	Peristaltic Pump	22.3	0.94	56528	36725	7.9	45		Clear
12/12/22	PW381	0089_PW381_221212	Peristaltic Pump	24	4.49	57014	37050	8.15	44		Clear
12/12/22	PW401	0089_PW401_221212	Peristaltic Pump	24.3	4.57	56161	36530	8.11	45.8		Clear
13/12/22	PW405	0089_PW405_221213	Peristaltic Pump	20.3	1.52	67797	40920	7.73	-212.9		Clear
13/12/22	PW407	0089_PW407_221213	Peristaltic Pump	20.6	1.16	66734	40040	7.57	-19.9		Clear
13/12/22	PW409	0089_PW409_221213	Peristaltic Pump	19.2	0.61	50946	37241	7.56	-230.5		Clear
14/12/22	PW411	0089_PW411_221214	Peristaltic Pump	22.6	1.37	55245	37618	7.6	-85.6		Clear
14/12/22	PW413	0089_PW413_221214	Peristaltic Pump	24.5	1.4	57293	37578	7.73	-178		Clear
14/12/22	PW415	0089_PW415_221214	Peristaltic Pump	23.7	0.91	52641	35091	7.64	-60.9		Clear

Monitoring Location	Date	Sample ID	Sampling Method	Sample Depth (m)	WaterBody Depth (m)	Location	Comments	Temp. (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Colour
SW130	12/12/22	0089_SW130_221212	Direct into Bottle	0.1	0.4	Onsite		21.5	3.95	54435	36531	7.86	-24.5	Clear
SW132	12/12/22	0089_SW132_221212	Direct into Bottle	0.1	0.4	Onsite	QC104/204	23.4	4.94	54931	36822	7.99	81.3	Clear
SW134	12/12/22	0089_SW134_221212	Direct into Bottle	0.1	0.4	Onsite	QC112/212	25	4	56361	36745	8.08	-224.9	Clear
SW150	12/12/22	0089_SW150_221212	Direct into Bottle	0.1	1	Onsite		23.7	5.2	56608	36790	8.1	-87.3	Clear
SW152	12/12/22	0089_SW152_221212	Direct into Bottle	0.1	1	Onsite		24	3.38	56363	36660	8.08	-32.7	Clear
SW154	12/12/22	0089_SW154_221212	Direct into Bottle	0.1	1	Onsite	QC109/209	24.5	3.47	56550	36725	8.16	-26.1	Clear
SW156	12/12/22	0089_SW156_221212	Direct into Bottle	0.1	1	Onsite		25.6	3.92	56408	36660	8.17	-61.5	Clear
SW305	12/12/22	0089_SW305_221212	Direct into Bottle	0.1	0.3	Onsite		26.2	3.07	52979	33720	7.8	-134.5	Clear
SW309	13/12/22	0089_SW309_221213	Direct into Bottle	0.2	0.5	Offsite		19.6	4.93	64136	39380	8.19	28.8	Clear
SW310	13/12/22	0089_SW310_221213	Direct into Bottle	0.2	0.5	Offsite		19.6	4.61	64273	39380	8.22	37.8	Clear
SW311	13/12/22	0089_SW311_221213	Direct into Bottle	0.2	0.5	Offsite		19.6	4.97	64272	39380	8.24	44.5	Clear
SW317	13/12/22	0089_SW317_221213	Direct into Bottle	0.1	0.5	Onsite		20.5	3.76	51189	36407	7.95	10	Clear
SW318	13/12/22	0089_SW318_221213	Direct into Bottle	0.1	0.4	Onsite		20.8	4.47	51242	36236	7.98	16.9	Clear
SW319	13/12/22	0089_SW319_221213	Direct into Bottle	0.1	0.4	Onsite		20.7	4.63	51323	36335	8.02	10.9	Clear
SW353	12/12/22	0089_SW353_221212	Direct into Bottle	0.1	1	Onsite		23.7	4.49	56024	36400	7.93	55.1	Clear
SW370	12/12/22	0089_SW370_221212	Direct into Bottle	0.3	0.5	Offsite		26.8	6.32	67905	36190	8.11	55.7	Clear
SW371	12/12/22	0089_SW371_221212	Direct into Bottle	0.1	0.3	Onsite		27.8	5.59	57466	35500	7.98	-154.6	Clear
SW372	12/12/22	0089_SW372_221212	Direct into Bottle	0.4	0.1	Onsite		28.1	6.24	53181	32629	8.09	-133.5	Clear
SW373	12/12/22	0089_SW373_221212	Direct into Bottle	0.1	0.4	Onsite		28.2	6.8	57872	35539	7.97	-69.8	Clear
SW382	12/12/22	0089_SW382_221212	Direct into Bottle	0.1	1	Onsite		23.3	4.38	56259	36595	8.21	47.1	Clear
SW383	12/12/22	0089_SW383_221212	Direct into Bottle	0.1	1	Onsite		23.3	4.17	56088	36465	8.14	40.9	Clear
SW384	12/12/22	0089_SW384_221212	Direct into Bottle	0.1	1	Onsite		23.8	4.29	56412	36660	8.09	47.4	Clear
SW406	13/12/22	0089_SW406_221213	Direct into Bottle	0.1	1			19.5	4.86	56255	36580	8.26	82.9	Clear
SW408	13/12/22	0089_SW408_221213	Direct into Bottle	0.1	1	Onsite		19.4	4.68	54992	35815	8.08	69.9	Clear
SW410	13/12/22	0089_SW410_221213	Direct into Bottle	0.1	0.3	Onsite		19.2	4.98	50051	36632	7.89	15.8	Clear
SW412	14/12/22	0089_SW412_221214	Direct into Bottle	0.1	0.4	Onsite		22.8	4.21	54681	37095	7.85	-45.1	Clear
SW414	14/12/22	0089_SW414_221214	Direct into Bottle	0.1	0.4	Onsite		23.4	4.2	55357	37045	7.89	-92.7	Clear
SW416	14/12/22	0089_SW416_221214	Direct into Bottle	0.1	0.5	Onsite		25.1	3.62	57973	37577	7.99	-46.1	Clear

Monitoring Location	Date	Sample ID	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description	Comments
SD304	12/12/22	0089_SD304_221212	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, trace organics	
SD306	13/12/22	0089_SD306_221213	0.2	Shovel, Trowel	Wet	Cream Sand	
SD307	13/12/22	0089_SD307_221213	0.2	Shovel, Trowel	Wet	Cream Sand	
SD308	13/12/22	0089_SD308_221213	0.2	Shovel, Trowel	Wet	Cream Sand	
SD314	13/12/22	0089_SD314_221213	0.5	Shovel, Trowel	Wet	Cream Sand	
SD315	13/12/22	0089_SD315_221213	0.1	Shovel, Trowel	Wet	Cream Sand	
SD316	13/12/22	0089_SD316_221213	0.1	Shovel, Trowel	Wet	Cream Sand	
SD329	12/12/22	0089_SD329_221212	0.5	Shovel, Trowel	Wet	Grey sand	
SD330	12/12/22	0089_SD330_221212	0.5	Shovel, Trowel	Wet	Grey sand	QC106/206
SD331	12/12/22	0089_SD331_221212	0.5	Shovel, Trowel	Wet	Grey sand	
SD335	12/12/22	0089_SD335_221212	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, trace organics, beige	
SD340	12/12/22	0089_SD340_221212	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics	
SD341	12/12/22	0089_SD341_221212	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, grey	QC110/210
SD345	13/12/22	0089_SD345_221213	0.2	Shovel, Trowel	Wet	Grey Sand	
SD346	12/12/22	0089_SD346_221212	0.5	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics	
SD350	12/12/22	0089_SD350_221212	0.5	Shovel, Trowel	Wet	Yellow cream Sand	
SD351	12/12/22	0089_SD351_221212	0.5	Shovel, Trowel	Wet	Cream Sand	
SD352	12/12/22	0089_SD352_221212	0.5	Shovel, Trowel	Wet	Cream Sand	
SD356	12/12/22	0089_SD356_221212	0.5	Shovel, Trowel	Wet	Grey sand	
SD357	12/12/22	0089_SD357_221212	0.5	Shovel, Trowel	Wet	Grey sand	
SD358	12/12/22	0089_SD358_221212	0.5	Shovel, Trowel	Wet	Grey sand	
SD362	12/12/22	0089_SD362_221212	0.5	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics	
SD363	12/12/22	0089_SD363_221212	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, grey,	
SD364	12/12/22	0089_SD364_221212	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, beige	QC102/202
SD367	13/12/22	0089_SD367_221213	0.5	Shovel, Trowel	Wet	Grey sand. Seaweed presence	
SD368	12/12/22	0089_SD368_221212	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, beige, trace organics	QC117/217
SD369	13/12/22	0089_SD369_221213	0.2	Shovel, Trowel	Wet	Grey Sand	
SD374	13/12/22	0089_SD374_221213	0.4	Shovel, Trowel	Wet	Sand, medium to coarse grained, well graded, beige, trace shells	
SD375	13/12/22	0089_SD375_221213	0.5	Shovel, Trowel	Wet	Sand, fine to coarse grained, beige, trace shells	
SD378	13/12/22	0089_SD378_221213	0.3	Shovel, Trowel	Wet	Sand, medium to coarse grained, well graded, beige, trace organics	
SD380	12/12/22	0089_SD380_221212	0.5	Shovel, Trowel	Wet	Cream Sand	
SD381	12/12/22	0089_SD381_221212	0.5	Shovel, Trowel	Wet	Cream Sand	
SD401	12/12/22	0089_SD401_221212	0.5	Shovel, Trowel	Wet	Cream Sand	
SD405	13/12/22	0089_SD405_221213	0.2	Shovel, Trowel	Wet	Grey Sand	
SD407	13/12/22	0089_SD407_221213	0.2	Shovel, Trowel	Wet	Grey Sand	
SD409	13/12/22	0089_SD409_221213	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, grey, trace shells	
SD411	14/12/22	0089_SD411_221214	0.1	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics	
SD413	14/12/22	0089_SD413_221214	0.1	Shovel, Trowel	Wet	Sand, fine to med grained, grey, trace shells	
SD415	14/12/22	0089_SD415_221214	0.1	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics, trace shells	

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Calibration Report

Multi-Parameter Water Quality Instrument

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 21G105325
Cable length: 20m (21H100708) 14S100770

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Needs spare batteries
	Battery Saver	✓	auto switches off after 30 mins.
Connections	Condition	✓	
Cable	Condition	✓	
Display	Operation	✓	
Firmware	Version	✓	4.00
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	
pH slope		✓	
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	
Conductivity			
Condition		✓	
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

				Instrument Readings				
Parameter	Standards	Calibration Point	Units	Before		After		Units
Temperature	Check Temp NATA		°C	NA				°C
pH 21G	pH 7.00	7.01	mV	7.17		7.01		pH
pH 21G	pH 4.00	4.00	mV	4.0		4.0		pH
Conductivity (21H100008) N/A	2760 µs/cm at 25°C	2760 µs/cm at 25°C	5.03	2745		2760		µs/cm
ORP (Reference check only) 21O	Zobell A & B	235	mV	203.3		235		mV
Zero DO (21G100131)	NaSO3 in distilled water	0.0	NA	0.0		0.0		%
100% DO (21G100131)	100% Air Saturation	100.0	uA	100%		100%		%

Calibrated by: [redacted] **Calibration Date:** 7/6/22

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Calibration Report

Multi-Parameter Water Quality Instrument

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 21G105325
Cable length: 4m (21F100778)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	needs new spare batteries.
	Battery Saver	✓	automatically switches off after 30mins
Connections	Condition	✓	
Cable	Condition	✓	
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	
pH slope		✓	
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	
Conductivity			
Condition		✓	
Temperature		✓	4°
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

Parameter	Standards	Calibration Point	Units	Instrument Readings: Before		Instrument Readings: After		Units
Temperature	Check Temp NATA		°C	NA				°C
pH 21G	pH 7.00	7.01	mV	6.93		7.01		pH
pH 21G	pH 4.00	4.00	mV	4.12		4.01		pH
Conductivity (21H100008) 1413	~~2764~~ µs/cm at 25°C 2,760	~~2764~~ 2760	5.03	2,743		2,760		µs/cm
ORP (Reference check only) 21O	Zobell A & B	235	mV	240		235		mV
Zero DO (21G100131)	NaSO3 in distilled water	0.0	NA	0.0		0.0		%
100% DO (21G100131)	100% Air Saturation	100.0	uA	100		100		%

Calibrated by: [redacted]

Calibration Date: 7/12/22

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Stantec
Contact: [redacted]

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 20H100323
Cable length: 1m 21H100135

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	172.10 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 57.71
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV -1 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Check Temp NATA	Room Temp	22.5	0	°C	NA	22.5	°C
pH (21E)	pH 7.00	375757	7.01	-38.40	mV	7.05	7.01	pH
pH (21E)	pH 4.00	378281	4.00	133.70	mV	3.91	4.00	pH
Conductivity (20A100465)	2764 µs/cm at 25°C	21/1012	2764	GLP	5.08	2731	2764	µs/cm
ORP (201214SIA605101)	Zobell A & B	22/2005	235	235	mV	185.9	235.3	mV
Zero DO (20C100608)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.3	0.0	%
100% DO (20C100608)	100% Air Saturation	Air	100.0	5.94	uA	104	100.0	%

Calibrated by: [redacted]

Calibration Date: 06-Dec-22
Next Due: 04-Jun-23

Date of Bump Test	Site ID	Unit Brand/ Model	Ambient Air Oxygen Calibration	Zero % Oxygen Solution Calibration	Standard Concentrations	Ambient Temperature (°C)	Bump Test Reading	Bump Test Readings within ±5%?	Comment	Test by (Name)	(Signature)
12/12/22	0089 - Sterling	YSI # 21G105325	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N ~~2,760~~ 35,000 Y/N	20.7	pH 4.00: 4.15 pH 7.00: 7.27 EC: ~~2,705~~ 35,019	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y N	N.I	[redacted]	
12/12/22	0089 - Sterling	YSI # 20 M	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y N 2,760 35,000 Y/N	19.8	pH 4.00: 4.08 pH 7.00: 7.09 EC: 30,250 2,850	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y N	N.I		
12/12/22	0089 - Sterling	YSI # 20H100323	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: ~~1,413µS/cm~~ 2,760 35,000 Y/N	20	pH 4.00: 4.14 pH 7.00: 7.17 EC: 2,760 34,990	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y N	N.I		
13/12/22	0089 - Sterling	YSI # 20H100323	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N ORP 240 Y/N	18.9	pH 4.00: 4.33 pH 7.00: 7.15 ~~Temp:~~ EC: 2905 ORP 244	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N ORP Y/N	N.I		
13/12/22	0089 - Sterling	YSI # 21G105325	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N ORP 240 Y/N	18.9	pH 4.00: 4.18 pH 7.00: 6.99 ~~Temp:~~ EC: 2,780 ORP 234.9	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y N ORP Y/N	N.I		
13/12/22	0089 - Sterling	YSI # 21G105325	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N ORP 240 Y/N	18.2	pH 4.00: 4.19 pH 7.00: 7.16 ~~Temp:~~ EC: 27993 ORP 236.6	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y N ORP Y/N	N.I		
14/12/22	0089 - Sterling	YSI # 21G105325	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y N ORP 220 Y/N	20.1	pH 4.00: 4.12 pH 7.00: 7.14 ~~Temp:~~ EC: 2,790 ORP 238.1	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y N ORP Y/N	N.I		
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			

APPENDIX

E

DATA QUALITY REVIEW

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Data Quality Review
PFAS Ongoing Monitoring Plan
Q4 2022 Monitoring Event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as trip blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

QA/QC Aspects	Evidence & Evaluation
	QA Documentation
Project Quality Plan/Work Plan and Data Quality Objectives	The field investigation was carried out between the 12th and 14th December 2022 and is generally in accordance with the proposed scope of work, as documented in the SAQP (PFAS OMP SAQP HMAS Stirling, Cardno, December 2022, Rev8) issued to the client and in general compliance with Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling,* NEPM "*National Environment Protection (Assessment of Site Contamination) Measure"* and PFAS NEMP 2.0. A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (PFAS OMP Q4 2022 Factual Report). In addition, a safety, health and environment work method statement (SHEWMS) was also prepared. The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.
	Data Representativeness
Use of Composites	No Composites were used during the investigation
Holding Times	Chain of custody and laboratory reports provide evidence of holding times. Holding times were generally in compliance with required timeframes. The following holding times exceedances occurred: ▪ Dissolved Major Cations (EP2216873, EP221676, EP221677, EP2216878, EP2216879, EP2216902, EP2216929, EP2216930, EP2216932, EP2216933, EP2216934, EP2216969, EP2216973, EP2217375) – generally 1-9 day(s) overdue. These holding time exceedances for dissolved cations are likely due to the Christmas shutdown period. The samples were placed in fridges at the laboratory. This is not considered to have adversely impacted the reliability of the results obtained, or the conclusions drawn from this assessment as non-PFAS analytes are not the key driver for risk assessment, decisions and recommendations.
Verification of field procedures	The methodology conducted during this investigation is documented in the body of the report and was in general conformance with the SAQP. Non-disposable equipment was decontaminated between sample locations.
Laboratory Reports	The following laboratory reports were considered for this data quality review: ▪ ALS reports: EP2216873, EP2216874, EP2216875, EP2216876, EP2216877, EP2216878, EP2216879, EP2216880, EP2216902, EP2216929, EP2216930, EP2216931, EP2216932, EP2216933, EP2216934, EP2216935, EP2216969, EP2216973, EP2216974, EP2216975.

<table>
<tr><th>QA/QC Aspects</th><th>Evidence & Evaluation</th></tr>
<tr><td></td><td>▪ Eurofins report: 950091</td></tr>
<tr><td colspan="2">Data Precision & Accuracy</td></tr>
<tr><td>QC sample Frequency</td><td>
<table>
<tr><th>QC sample type</th><th>SAQP required frequency</th><th>Sample Collected</th></tr>
<tr><td>Blind duplicate</td><td>1 in 10 primary samples (10%)</td><td>7 for 61 groundwater samples (11.5%)
4 for 39 porewater samples (10.3%)
3 in 28 surface water samples (10.7%)
4 in 39 sediment samples (10.3%)</td></tr>
<tr><td>Interlab duplicate</td><td>1 in 10 primary samples (10%)</td><td>7 for 61 groundwater samples (11.5%)
4 for 39 porewater samples (10.3%)
3 in 28 surface water samples (10.7%)
4 in 39 sediment samples (10.3%)</td></tr>
<tr><td>Rinsate</td><td>1 per field crew per day</td><td>7 for 3 days (up to 3 field personnel/day) (100%)</td></tr>
<tr><td>Field Blank</td><td>1 per field crew per day</td><td>7 for 3 days (up to 3 field personnel/day) (100%)</td></tr>
</table>
The required QC frequency was achieved for all sample types.</td></tr>
<tr><td>RPD Acceptance criteria</td><td>
<table>
<tr><th>Magnitude of Results</th><th>Acceptable RPD range</th></tr>
<tr><td>< 10 x LOR</td><td>No limits</td></tr>
<tr><td>10 – 20 LOR</td><td>0% - 50%</td></tr>
<tr><td>> 20 x LOR</td><td>0% - 20%</td></tr>
</table></td></tr>
<tr><td>QC Testing – Blind Duplicates (Primary Lab)</td><td>Groundwater
▪ Primary Groundwater Samples Analysed: 61
▪ Blind Duplicate Samples Analysed: 7
All RPDs were within acceptance criteria.
Porewater
▪ Primary porewater Samples Analysed: 39
▪ Blind Duplicate Samples Analysed: 4
All RPDs were within acceptance criteria with the following exceptions:
▪ QC118 (PFHxS – 29%, PFOS – 22%).
These minor RPDs differences (<30%) are likely due to the difference or methodologies between the primary and secondary laboratories and the low concentrations of analytes under review. This is not considered to have impacted the validity of the interpretation drawn upon this dataset.
Surface water
▪ Primary surface water Samples Analysed: 28
▪ Blind Duplicate Samples Analysed: 3
All RPDs were within acceptance criteria.
Sediment
▪ Primary Sediment Samples Analysed: 39
▪ Blind Duplicate Samples Analysed: 4
All RPDs were within acceptance criteria.</td></tr>
</table>

QA/QC Aspects	Evidence & Evaluation
QC Testing – Interlab Duplicates (Secondary Lab)	***Groundwater*** ▪ Primary Groundwater Samples Analysed: 61 ▪ Interlab Duplicate Samples Analysed: 7 All RPDs were within acceptance criteria with the following exceptions: ▪ QC201 (PFBS – 31%, PFPeS – 44%, PFHpS – 58%, PFOS – 35%, PFPeA – 27%). These RPDs differences are likely due to the difference or methodologies between the primary and secondary laboratories and the low concentrations of analytes under review. This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Porewater*** ▪ Primary porewater Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria with the following exceptions: ▪ QC218 (PFHxS – 24%, PFOS – 25%). These minor RPDs differences (<30%) are likely due to the difference or methodologies between the primary and secondary laboratories and the low concentrations of analytes under review. This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Surface water*** ▪ Primary surface water Samples Analysed: 28 ▪ Interlab Duplicate Samples Analysed: 3 All RPDs were within acceptance criteria. ***Sediment*** ▪ Primary sediment Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria.
Field Blanks	Field Blanks were collected at a rate of one per fieldwork day. All field blank samples tested reported analytes below the laboratory limit of reporting.
Laboratory Internal QC	Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, matrix spikes, laboratory control samples and laboratory duplicates. All Method Blank results were within acceptable range. All Laboratory Control Spike reported recoveries within the acceptance range with the exception of the following: ▪ EP2216879: - Sulfate recovery less than lower control limit. All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following: ▪ EP2216873, EP2216876, EP2216877, EP2216878, EP2216879, EP2216902, EP2216929, EP2216930, EP2216932, EP2216969: - Samples ID: PW356, MW171, MW124, SW130, MW149, PW407, SW406anonymous: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2216932, EP2216933: - Samples ID MW258, anonymous: PFBS, PFPeS, PFHxS, PFOS, PFPeA and PFHxA matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level. ▪ EP2217375: - Sample ID Anonymous: Sulfate matrix spike recovery not determined due to the background concentrations exceeding 4x spike level.

QA/QC Aspects	Evidence & Evaluation
	The following quality control samples frequency outliers were reported: ▪ EP2216873, EP221676, EP2216877, EP2216879, EP2216902, EP2216929, EP2216930, EP2216932, EP2216973: - Laboratory Duplicates: PFAS by LCMSMS, expected frequency 10% not achieved. ▪ EP2216873, EP2216876, EP2216877, EP2216879: - Matrix Spikes: PFAS by LCMSMS, expected frequency 5% not achieved. The above outliers/exceptions are not considered to affect the reliability of the dataset.
Laboratory Method Detection Limit	Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.
NATA endorsement of laboratory reports	Laboratory reports were stamped with the NATA endorsement stamp and signature. ALS Accreditation No. 825 Eurofins ARL Accreditation No. 1261
Calibration of Field Equipment	All equipment used during the investigation was calibrated by the supplier prior to use and daily readings of reference solutions (bump tests) were completed. The equipment calibration certificates and daily field bump test records are provided in Appendix D.
Decontamination and Equipment Blanks	Rinsate blanks were collected at a rate of one per day per sampler when reusable equipment was used. All rinsate samples tested reported analytes concentrations below the laboratory LORs.
	Data Comparability
Standard Procedures	Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.
Qualified Personnel	Staff involved in managing and reviewing the project and those involved in fieldwork are experienced and qualified personnel.
Sample Integrity	Field Chain of Custody/Laboratory request forms can be found in Appendix C.
	Data Completeness
Completeness of test program	The scope of work undertaken was generally consistent with the SAQP.
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection process and therefore, the data set used as the basis for groundwater, surface water, porewater and sediment investigation is considered valid and complete.

PFAS OMP Quarterly Sampling Event Factual Report

March 2023

HMAS Stirling

304700525

Prepared for

Department of Defence

9 May 2023

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now

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Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

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Chemical Names

DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluorohexane Sulfonate
PFOA	Per-fluorooctanoic Acid
PFOS	Per-fluorooctane Sulfonate

Technical Terms

AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
AS	Australian Standard
BGL	Below Ground Level
CEC	Cation Exchange Capacity
COC	Chain of Custody
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
DWER	Department of Water and Environmental Regulation
EC	Electrical Conductivity
EPA	Environment Protection Authority
ERA	Ecological Risk Assessment
ESA	Environmental Site Assessment
HEPA	Heads of Environmental Protection Authority
LOR	Limit of Reporting
N/A	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEMP	National Environmental Management Plan
NEPM	National Environmental Protection Measure
ORP	Oxidation Reduction Potential
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
RWL	Reduced water levels
SAQP	Sampling and Analysis Quality Plan
SWL	Standing water level

Units

ha	Hectares
mAHD	Metres relative to the Australia Heigh Datum
mBGL	Metres Below Ground Level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
µg/L	Microgram per Litre
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity – Water)

Site Specific

OMP	Ongoing Monitoring Plan
FTA	Fire Training Area
HSF	Helicopter Support Facility

1 Introduction

1.1 Background

Cardno was engaged by the Australian Department of Defence ("the Client") to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) at HMAS Stirling ("the site"). The site is located on Garden Island, Western Australia.

The OMP was carried out in accordance with the scope and limitations presented in Cardno's Sampling and Analysis Quality Plan (SAQP):

> Cardno, February 2023, Reference: DEF19009, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling.* Rev 9.

The SAQP was reviewed prior to the Q1 2023 monitoring event, and MW496 was added to the groundwater monitoring network in replacement of nearby damaged well MW248.

For the purposes of this report:

> The Management Area was defined as comprising of Garden Island and the marine nearshore environment (Figure 1A, Appendix A).

1.2 Purpose & Objectives

The objective of the OMP is to assess the changes in the nature and extent of PFAS within the environment, specifically where there is an identified potentially elevated risk to a receptor or a potential future risk to a receptor associated with Defence's historical use of legacy Aqueous Film Forming Foam (AFFF).

The purpose of this PFAS OMP factual report is to provide an up-to-date status of the condition of the site as it is currently understood in relation to the most recent sampling event.

The objectives of the report are:

> To provide a succinct summary of the Q1 2023 sampling event and provision of analytical results with supporting tables and figures.

> To provide confirmation of the current understanding of risk.

> To provide supporting data for the assessment of management actions, where relevant.

1.3 Relevant Guidelines

This assessment has been undertaken in general accordance with applicable industry standards for a site investigation for the purpose, objectives and scope identified in this report. These standards are set out in:

> National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended 2013) (ASC NEPM).

> Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, *PFAS National Environmental Management Plan (NEMP) 2.0*.

> Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds*.

> Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling*.

> Australian and New Zealand Guidelines, 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

> Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*[1].

[1] It is noted that the site is located on Commonwealth Land and is regulated under the Commonwealth environmental legislation, the State based DWER guidelines are relevant for the sampling of off-site properties and waterways.

> Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.

> U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*.

> U.S. EPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8).*

> National Health and Medical Research Council (NHMRC), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

2 Scope of Work

Cardno carried out the tasks detailed in the following sections in order to satisfy the purpose and objectives of this assessment. The PFAS source areas are shown on Figure 1B, Appendix A.

2.1 Groundwater Monitoring

Sampling of selected groundwater monitoring wells was performed in general accordance with the SAQP (Cardno, 2023), applying methods set out in Section 3 of this report. The groundwater wells monitored as part of the OMP are presented in Table 2-1, and are shown on Figures 2A and 2B, Appendix A.

Table 2-1 Groundwater Monitoring Locations

Monitoring Area	Location ID	No.
Demolition Ground	MW139, MW141, MW142, MW147, MW149	5
Fire Training Area	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128	11
Waste water treatment plant	MW158, MW161, MW166, MW171, MW172, MW173, MW193, MW195D, MW195S, MW196, MW197, MW199, MW200, MW202, MW203	15
Accommodation Area	MW288, MW289	2
Dredged Sediments	MW268, MW269	2
AVCAT Storage and Fuel Farm	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW516, MW249, MW496	11
Fire Station, Flammable / Hazardous Goods and Waste Storage, Ship Sullage	MW255, MW256, MW257, MW258, MW259,	5
Helicopter Support Facility	MW214, MW215, MW216, MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282	11

2.2 Porewater, Surface Water and Sediment Monitoring

Porewater, sediment and surface water sampling were performed in general accordance with the SAQP (Cardno, 2023), applying methods set out in Section 3 of this report. The porewater, surface water and sediment monitoring locations monitored as part of the OMP are presented in Table 2-2, and are shown on Figures 3A to 5B, Appendix A.

Table 2-2 Porewater, Surface Water and Sediment Monitoring Locations

Monitoring Area	Porewater Sampling Location ID	No.	Sediment Sampling Location ID	No.	Surface Water Sampling Location ID	No.
Demolition Ground	PW329, PW330, PW331, PW356, PW357, PW358	6	SD329, SD330, SD331, SD356, SD357, SD358	6	SW150, SW152, SW154, SW156	4
Fire Training Area	PW335, PW340, PW341, PW362, PW363, PW364	6	SD335, SD340, SD341, SD362, SD363, SD364	6	SW130, SW132, SW134	3
WWTP	PW304, PW345, PW367, PW368, PW369, PW350, PW351, PW352, PW380, PW381, PW401	11	SD304, SD345, SD367, SD368, SD369, SD350, SD351, SD352, SD380, SD381, SD401	11	SW305, SW370, SW371, SW372, SW373, SW353, SW382, SW383, SW384	9
Accommodation Area	PW346	1	SD346	1		
Dredged Sediments	PW374, PW375, PW378	3	SD374, SD375, SD378	3	SW317, SW318, SW319	3
Helicopter Support Facility	PW306, PW307, PW308, PW314, PW315, PW316, PW405, PW407, PW409, PW411, PW413, PW415	12	SD306, SD307, SD308, SD314, SD315, SD316, SD405, SD407, SD409, SD411, SD413, SD415	12	SW309, SW310, SW311, SW406, SW408, SW410, SW412, SW414, SW416	9

2.3 Data Management

All the data included in the report has been collected, uploaded, and reviewed according to the data management requirements of the *Defence Contamination Management Manual* (DCMM) Annex L (Defence, 2021), including:

- The sample naming convention detailed in the DCMM Annex L was used in the field;
- All field data collected was uploaded to the ESdat database;
- Laboratory data was uploaded and approved; and
- QA/QC data was reconciled.

2.4 Deviations from the OMP SAQP

Deviations from the SAQP for the Q1 2023 monitoring event are presented in Table 2-3 below.

Table 2-3 Deviations from OMP SAQP

Location	Deviation	Comments/Impact
MW128	Not Sampled	Well found dry, limited impact on dataset, monitoring is undertaken quarterly, and this location will be sampled in Q2 2023. Other wells targeting the FTA were sampled during Q1 2023.
MW236	Not Sampled	Well found dry, limited impact on dataset, monitoring is undertaken quarterly, and this location will be sampled in Q2 2023.
MW220	No SWL recorded	SWL could not be recorded due to unreliable reading with the dip metre. No impact, nearby wells' SWL were used to draw inferred groundwater contours.
MW282	No field parameters recorded	Insufficient amount of water left in HydraSleeve® to take field readings. No impact, wells are monitored quarterly, and field parameters are not driving any critical OMP decisions.

3 Methodology

3.1 Groundwater Sampling Methodology

Groundwater monitoring was generally undertaken by no purge HydraSleeve® method as detailed in Table 3-1.

Table 3-1 Groundwater Sampling Methodology

Activity	Details
Well Gauging	Standing Water Levels (SWL) were gauged using an interface probe. All wells were measured against a surveyed mark at the top of the well casing. Time of gauging was recorded on field records sheets.
Groundwater Field Parameters	Groundwater field parameters were recorded via a pre-calibrated water quality meter prior to deployment of HydraSleeves® or pre-sample collection. The following field parameters were recorded: ▪ pH ▪ electrical conductivity (EC) ▪ oxidation reduction potential (ORP) ▪ Dissolved oxygen (DO) ▪ Temperature Once field parameters were stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurements were recorded on field data records. All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and bump tested daily to optimise the accuracy of the measurements taken. Calibration certificates and bump test records are provided in Appendix D.
Deployment of HydraSleeve®	HydraSleeve® were deployed with top weight for sample collection to begin at the lowest point. Following Q1 2023 sampling, new HydraSleeve® were deployed in preparation for the next OMP monitoring event scheduled for Q2 2023, using the same string for consistency (same depth of sampling i.e. within screen depth).
Retrieval of HydraSleeve® (Sample Collection)	HydraSleeve® sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. HydraSleeve® used during Q1 2023 were the ones deployed following Q4 2022. Samples were collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples were discharged immediately (minimise changes in chemistry) via discharge tube.
Hand bailing (alternative sampling method)	Disposable HDPE hand bailers, attached to a polypropylene string, were used at wells where the water column wasn't sufficient to fill the HydraSleeve®. Purging of the well was undertaken prior to sampling to ensure that a sample representative of the aquifer is taken (i.e. removal of 3x well volume).
Decontamination procedure	Dedicated HydraSleeve® and HDPE hand bailers (single use and disposable) were used at each groundwater well thus removing the need for decontamination. All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample bottle was pre-labelled by the laboratory with a unique barcode. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). Where holding times did not comply, this is discussed in the data quality review in Appendix E.

Activity	Details
Quality Control	Groundwater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Groundwater samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance). The primary laboratory was ALS Global Laboratories (Perth), and the secondary laboratory (quality control) was Eurofins (Perth). Both laboratories are NATA-accredited for the parameters tested. Copies of the NATA stamped laboratory reports and CoC documentation are included in Appendix C.

3.2 Porewater and Sediment Sampling Methodology

The methodologies for sediment and porewater sampling are detailed in Table 3-2 and Table 3-3 respectively.

Table 3-2 Sediment Sampling Methodology

Item	Details
Sample Collection	Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.
Field Parameters	At each sampling location, the sediment sample was visually assessed, and observations (including physical description) were recorded on field data sheets.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Quality Control	Sediment QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples greater than 1 per 10 primary samples. ▪ Field triplicate (inter-laboratory) samples greater than 1 per 10 primary samples sent to a secondary laboratory.
Laboratory Testing	Sediment samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes).

Table 3-3 Porewater Sampling Methodology

Item	Detail
Porewater Sample Collection	Porewater sampling was undertaken in accordance with the U.S. EPA guidance *Operating Procedure Pore Water Sampling*. Porewater was purged and sampled at less than 1 L per minute using a peristaltic pump, connected to a stainless steel tube with a screened section at its base (Drive-Point Piezometer). The porewater sampler was inserted to at least 1 m below the surficial marine sediments, to ensure collection of pore water rather than surface water. Tubing was replaced at each sampling location to prevent cross-contamination.
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.

Item	Detail
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Porewater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Porewater samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.3 Surface Water Sampling Methodology

The methodology for the surface water monitoring is detailed in Table 3-4.

Table 3-4 Surface water Sampling Methodology

Item	Details
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature Field observations such as odours or sheen presence were also recorded on field sampling sheets.
Sampling Method	Surface water samples were collected directly into sample containers using a 'Grab' (manual) sample method via a long-handled sampling device. The sample container was positioned 10 cm below the surface water level where possible and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films. Samples were collected in accordance with Australian/New Zealand Standards (AS/NZS 5667.1:1998) *Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Surface water QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Surface water samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.4 Quality Control / Quality Assurance

A critical aspect of site assessments is the demonstration of the quality of the data used as the basis for the assessment. This is achieved through a Data Validation process which includes a review of the following data quality indicators, as described in the SAQP:

> QA documentation.

> Bias.

> Data Representativeness.

- Data Precision & Accuracy.
- Laboratory Performance.
- Data Comparability.
- Data Set Completeness.

A detailed review of these aspects has been undertaken, the results of which are presented in Appendix E. The QA/QC review concluded that there are no significant systematic errors in the data collection process and therefore, the dataset used for the assessment is considered valid and complete.

3.5 Assessment Criteria

3.5.1 Groundwater, Porewater and Surface Water

The adopted assessment criteria for groundwater, porewater and surface water are detailed in Table 3-5.

Table 3-5 Criteria for Groundwater, Porewater and Surface Water

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	µg/L		
Human Health - Drinking Water Quality Guideline	0.07[1]	0.56	HEPA 2020
Human Health – Recreational Water	2[1]	10	HEPA 2020
Ecological – 99% species protection	0.00023[2]	19	HEPA 2020

Notes:

1. Sum of PFOS and PFHxS.
2. PFOS only. The criterion of 0.00023 µg/L is lower than the laboratory level of reporting (LOR), however, the PFAS NEMP 2020 allows for the adoption of the laboratory LOR as a screening level rather than a quantified measurement.

3.5.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment.

4 Field Observations and Results

4.1 General Site Observations

No weather event that could have impacted the sampling or results obtained was observed. The maximum daily temperature during the monitoring event varied between 24.3 and 26.0ºC. Some construction works were still ongoing within the accommodation area, however, didn't include dewatering or deep excavations works and therefore, are not considered to have affected the results obtained as part of the Q1 2023 monitoring event.

4.2 Groundwater

4.2.1 Summary of Field Observations

4.2.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the groundwater sampling event are presented in field sampling records, included in Appendix D. Field parameters were generally consistent with previous monitoring events. Groundwater pH ranged from 6.36 (MW126) to 8.32 (MW233) and was slightly acidic to near neutral, water was observed clear to brown in colour. Groundwater temperature ranged from 19.7°C (MW233) to 24.4°C (MW242). DO readings ranged from 0.16 mg/L (MW125) to 6.5 mg/L (MW224) which mostly indicate aerobic groundwater conditions. EC readings ranged from 229.1 µS/cm (MW203) to 48,864 µS/cm (MW149) and indicate fresh to highly saline groundwater conditions. There was a sulphur odour noted at several groundwater wells (MW124, MW126, MW226, MW227, MW228, MW288, MW496). Hydrocarbon odour was noted at MW245 within the fuel storage area which is consistent with previous event's field records.

4.2.1.2 Groundwater Elevation and Migration

Groundwater gauging data and reduced water levels (RWL) are provided within the field records in Appendix D. The groundwater elevations ranged between 0.05 mAHD (MW124) and 0.913 mAHD (MW171). It is expected that groundwater levels and flow direction for monitoring well relatively close to the shoreline are locally and temporally influenced by tidal pressures.

Gauging data was used to infer the groundwater migration contours. Groundwater flow was interpreted to be radial from the site and towards areas of depression following local topography (i.e. groundwater generally flows towards the nearest coastline), which is consistent with previous monitoring events. Groundwater inferred elevation contours and inferred flow direction for the Q1 2023 monitoring event are shown in Figure 6, Appendix A.

4.2.2 Groundwater Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-1. Laboratory results have also been compared to available historical data in order to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figures 2A and 2B in Appendix A presents the groundwater monitoring locations. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	MW112, MW120, MW141, MW282, MW500	0.56[2]	8.27 (MW282)	60	5

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
Sum of PFOS and PFHxS	MW109, MW112, MW120, MW121, MW123, MW125, MW141, MW142, MW147 MW161, MW166, MW171, MW172, MW173, MW193, MW215, MW216, MW217, MW220, MW228, MW233, MW239, MW240, MW243, MW249, MW255, MW256, MW257, MW258, MW259, MW268, MW269, MW282, MW288, MW289, MW496, MW500	0.07[2]	107.0 (MW282)	60	37
PFOS	MW109, MW112, MW120, MW121, MW123 MW141, MW142, MW147, MW161, MW166, MW171, MW172, MW173, MW193, MW195D, MW196, MW197, MW202, MW216, MW217, MW220, MW233, MW239, MW242, MW245, MW249, MW255, MW256, MW257, MW258, MW259, MW269, MW282, MW288, MW289, MW496, MW500, MW516	0.01[3]	72.5 (MW141)	60	38

Notes:

1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water.
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

- MW123, located at the FTA, reported a new exceedance of the recreational use criteria for the Sum of PFOS and PFHxS (2.0 µg/L, 2.27 µg/L detected).
- MW196, located East of the WWTP, reported a first-time detection and a new exceedance of the ecological criteria (LOR adopted, 0.04 µg/L detected) for PFOS.

4.3 Surface Water

4.3.1 Summary of Field Observations

4.3.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the surface water sampling program are presented in field sampling records, included in Appendix D. Parameters were generally consistent with the previous monitoring events. Surface water pH ranged from 6.94 (SW150) to 8.27 (SW414) and was near neutral, temperature was 25.5°C on average, water was generally clear and EC readings ranging 50,461 (SW150) to 60,356 µS/cm (SW130) indicate highly saline conditions. DO readings ranging 1.36 (SW370) to 5.9 mg/L (SW414) indicate aerobic surface water conditions. No visual or olfactory evidence of contamination were recorded.

4.3.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-2. Laboratory results have also been compared to available historical data. Figures 3A and 3B in Appendix A presents the surface water monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-2 Summary of Surface water Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	28	0

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
Sum of PFOS and PFHxS	SW373	0.07[2]	0.15 (SW373)	28	1
PFOS	SW130, SW305, SW370, SW371, SW372, SW373	0.01[3]	0.13 (SW373)	28	6

Notes:

1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the surface water monitoring locations in Q1 2023.

4.4 Porewater

4.4.1 Summary of Field Observations

4.4.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the porewater sampling program are presented in field sampling records, included in Appendix D. Parameters were generally consistent with the previous monitoring events. Porewater pH ranging 6.33 (PW368) to 8.12 (PW316) was near neutral, with an average temperature of 24.8°C. Water was generally clear and EC readings ranging 25,742 (PW378) to 69,257 µS/cm (PW369) indicate saline to highly saline porewater conditions. DO readings ranging 0.08 (PW340) to 9.95 mg/L (PW401) mostly indicate aerobic porewater condition. A sulphur odour was noted at several sampling locations (PW335, PW340, PW362, PW364, PW368) which can be related to seaweed degradation.

4.4.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-3. Laboratory results have also been compared to available historical data. Figures 4A and 4B in Appendix A presents the porewater monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-3 Summary of Porewater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	39	0
Sum of PFOS and PFHxS	PW335, PW346	0.07[2]	0.23 (PW346)	39	2
PFOS	PW304, PW335, PW340, PW341, PW345, PW346, PW350, PW351, PW352, PW362, PW363, PW364, PW367, PW368, PW369, PW375, PW378	0.01[3]	0.22 (PW346)	39	17

Notes:

1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water.
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations in Q1 2023.

4.5 Sediment

4.5.1 Summary of Field Observations

Observations recorded during the sediment sampling program are provided in the field sampling records within Appendix D. Sediment samples were generally described as beige, fine to medium grained, wet sand.

4.5.2 Laboratory Results

The results of laboratory analysis have been compared to available historical data. Figures 5A and 5B in Appendix A presents the sediment monitoring locations. Tabulated results are presented in Appendix B and the laboratory reports are provided in Appendix C.

Findings are summarised as follows:

> No first-time detection of PFOS or Sum of PFOS and PFHxS was reported for the sediment monitoring locations in Q1 2023.

4.6 Changes to the Monitoring Network Condition

The following changes to the OMP monitoring network were noted during Q1 2023:

> MW147 at the demolition ground was unblocked and sampled.

> The sandy stockpile near MW239 was removed and the monitoring well is no longer at risk of being compromised.

5 Summary and Conclusions

Cardno undertook the Q1 2023 groundwater, porewater, surface water and sediment monitoring event at HMAS Stirling as part of the PFAS OMP. Sampling and testing was undertaken at 60 monitoring wells, 28 surface water locations and 39 sediment and porewater co-located sampling locations.

Groundwater levels were gauged in all wells before sampling. Groundwater flow was interpreted to be radial from the site where mounding of groundwater is occurring (i.e. groundwater follows the site's topography and flows towards the ocean), consistent with the previous monitoring events.

The groundwater laboratory results reported the following:

- Of the 60 samples that were tested, PFOA (5 samples), PFOS (38 samples) and Sum of PFHxS and PFOS (37 samples) reported concentrations that exceeded adopted assessment criteria.
- MW123, located at the FTA, reported a new exceedance of the recreational use criteria for the Sum of PFOS and PFHxS (2.0 µg/L, 2.27 µg/L detected).
- MW196, located East of the WWTP, reported a first-time detection and a new exceedance of the ecological criteria (LOR adopted, 0.04 µg/L detected) for PFOS.

The surface water laboratory results reported the following:

- Of the 28 samples tested, PFOS (6 samples) and Sum of PFHxS and PFOS (1 sample) were reported above the adopted assessment criteria.
- No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the surface water monitoring locations in Q1 2023.

The porewater laboratory results reported the following:

- Of the 39 samples that were tested, PFOS (17 samples) and Sum of PFOS and PFHxS (2 samples) reported concentrations above adopted assessment criteria.
- No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations in Q1 2023.

The sediment laboratory results reported the following:

- No first-time detection was reported for the sediment monitoring locations in Q1 2023.

The following actions should be undertaken prior to the next OMP sampling event:

- Replacement of the groundwater monitoring wells lost/damaged at the demolition ground (MW137, MW272) and main base area (MW517, MW264, MW518, MW010, MW261).

The next OMP sampling event for HMAS Stirling will be the quarterly monitoring event (Q2 2023), scheduled for June 2023. An Annual Interpretive Report will be prepared for the October 2021 – September 2022 monitoring period.

6 References

General References

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7. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (https://maps.water.wa.gov.au/#/webmap/gwm).
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11. National Health and Medical Research Council (NHMRC) (2011 – updated 2022) *National Water Quality Management Strategy Australian Drinking Water Guidelines 6*, September 2022.
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15. USEPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8).*

Site Specific References

16. Department of Defence, January 2019, *HMAS Stirling Garden Island PFAS Management Area Plan*, Final.
17. Cardno, 11 August 2022, Reference: DEF19009, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling*. Rev 7.
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20. Cardno, 23 September 2020, *PFAS OMP 2020 Q2 Quarterly Sampling Event Factual Report*, HMAS Stirling.
21. Cardno, 22 January 2021, *PFAS OMP 2020 Q3 Quarterly Sampling Event Factual Report*, HMAS Stirling.
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27. Cardno, April 2022, *PFAS OMP 2021 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling.

28. Cardno, now Stantec, October 2022, *draft PFAS OMP 2021 Annual Interpretive Report.*

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APPENDIX

A

FIGURES

Cardno

now

Stantec

FIGURE 1A

1:32,000 Scale at A3

Metres

0 500 1,000

Site Location

Q1 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-03-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001A_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Map

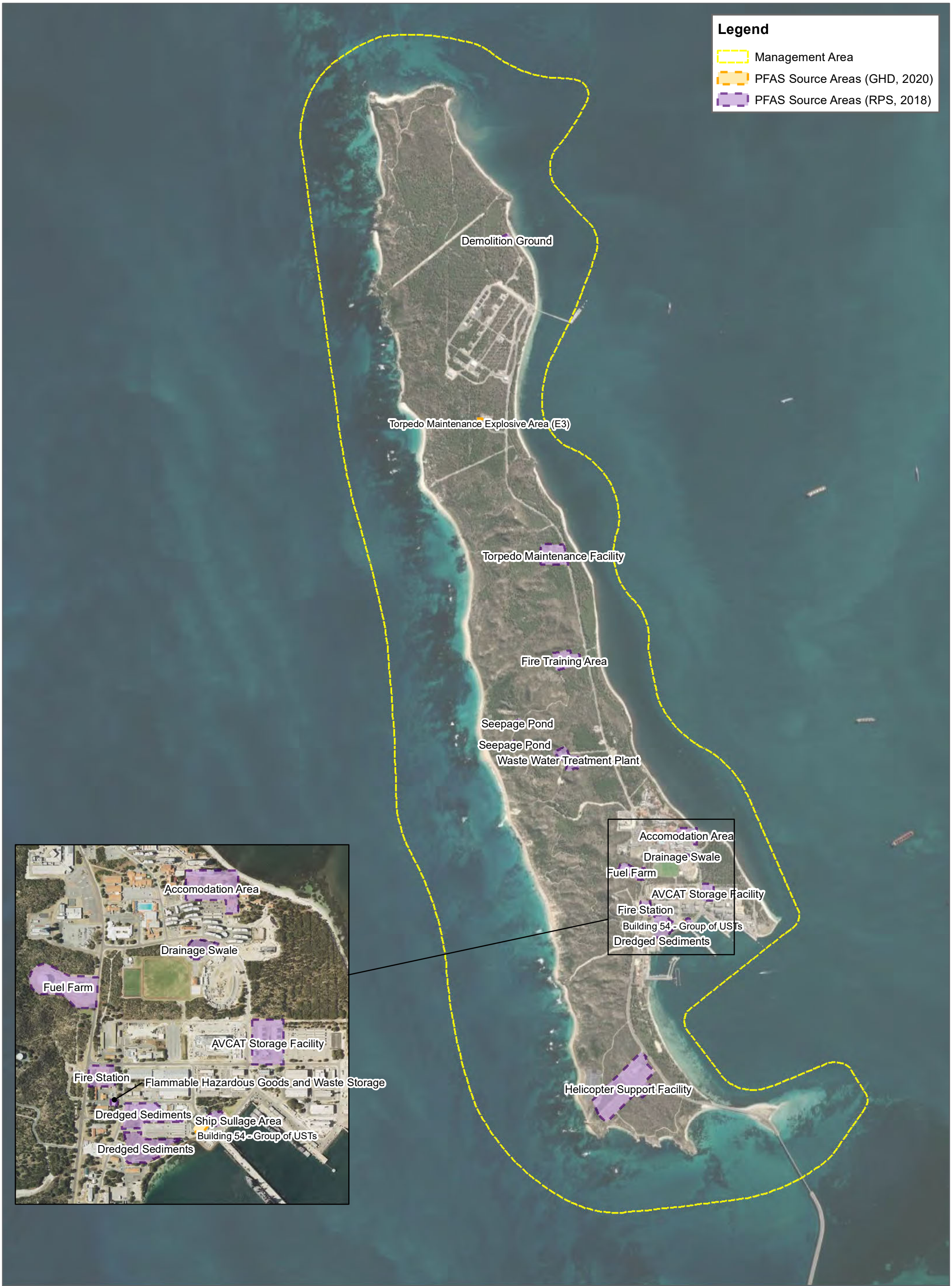


FIGURE 1B

1:32,000 Scale at A3

Metres

0 500 1,000

Management Area

Q1 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-03-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001B_ManagementArea 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap

MW124
MW112
MW128
MW125
MW120
MW123
MW126
MW121
MW127
MW158
MW166
MW172
MW173
MW195D
MW195S
MW196
MW197
MW171
MW199
MW200
MW193
MW203
MW202
MW288
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW245
MW243
MW255
MW256
MW516
MW496
MW258
MW259
MW269
MW268
MW124
MW109
MW112
MW128
MW125
MW500
MW120
MW121
MW123
MW126
MW127
MW236
MW238
MW239
MW242
MW243
MW245
MW249
MW255
MW256
MW516
MW496
MW259
MW258
MW269
MW268
MW228
MW217
MW220
MW227
MW214
MW216
MW226
MW224
MW282
MW225
MW215
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Groundwater Result Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedace of a guideline value
Not Sampled
FIGURE 2A
1:12,500 Scale at A3
Metres
0
300
600
Groundwater Results
Q1 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-03-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002A_2023Q1_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex

FIGURE 2B

1:15,000 Scale at A3

Metres

0 250 500

Groundwater Results

Q1 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-03-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002B_2023Q1_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex

FIGURE 3A

1:15,000 Scale at A3

Metres

0 300 600

Surface water Results

Q1 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-03-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003A_2023Q1_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex

FIGURE 3B

1:15,000 Scale at A3

Metres

0 300 600

Surface water Results

Q1 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-03-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003B_2023Q1_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

PW335
PW364
PW362
PW340
PW341
PW363
PW350
PW401
PW380
PW351
PW381
PW352
PW369
PW345
PW367
PW368
PW304
PW346
PW314
PW315
PW306
PW307
PW316
PW308
PW378
PW375
PW374
PW405
PW407
PW409
PW411
PW413
PW415
PW306
PW315
PW316
PW308
PW307

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Porewater Results Summary

- No first-time detection or new exceedance
- First-time detection of PFOA or PFOS+PFHxS
- New exceedance of a guideline value

FIGURE 4A

1:15,000 Scale at A3

Metres

0 300 600

Porewater Results

Q1 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-03-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004A_2023Q1_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth

FIGURE 4B

1:15,000 Scale at A3

Metres

0 300 600

Porewater Results

Q1 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-03-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004B_2023Q1_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

SD335
SD364
SD362
SD340
SD341
SD363
SD350
SD401
SD380
SD381
SD351
SD352
SD369
SD345
SD367
SD368
SD304
SD346
SD314
SD315
SD306
SD307
SD316
SD308
SD378
SD375
SD374
SD405
SD407
SD409
SD411
SD413
SD415
SD306
SD315
SD316
SD308
SD307

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Sediment Result Summary

- No first-time detection or new exceedance
- First-time detection of PFOA or PFOS+PFHxS
- New exceedance of a guideline value

FIGURE 5A

1:15,000 Scale at A3

Metres

0 300 600

Sediment Results

Q1 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-03-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005A_2023Q1_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth

FIGURE 5B

1:15,000 Scale at A3

Metres

0 300 600

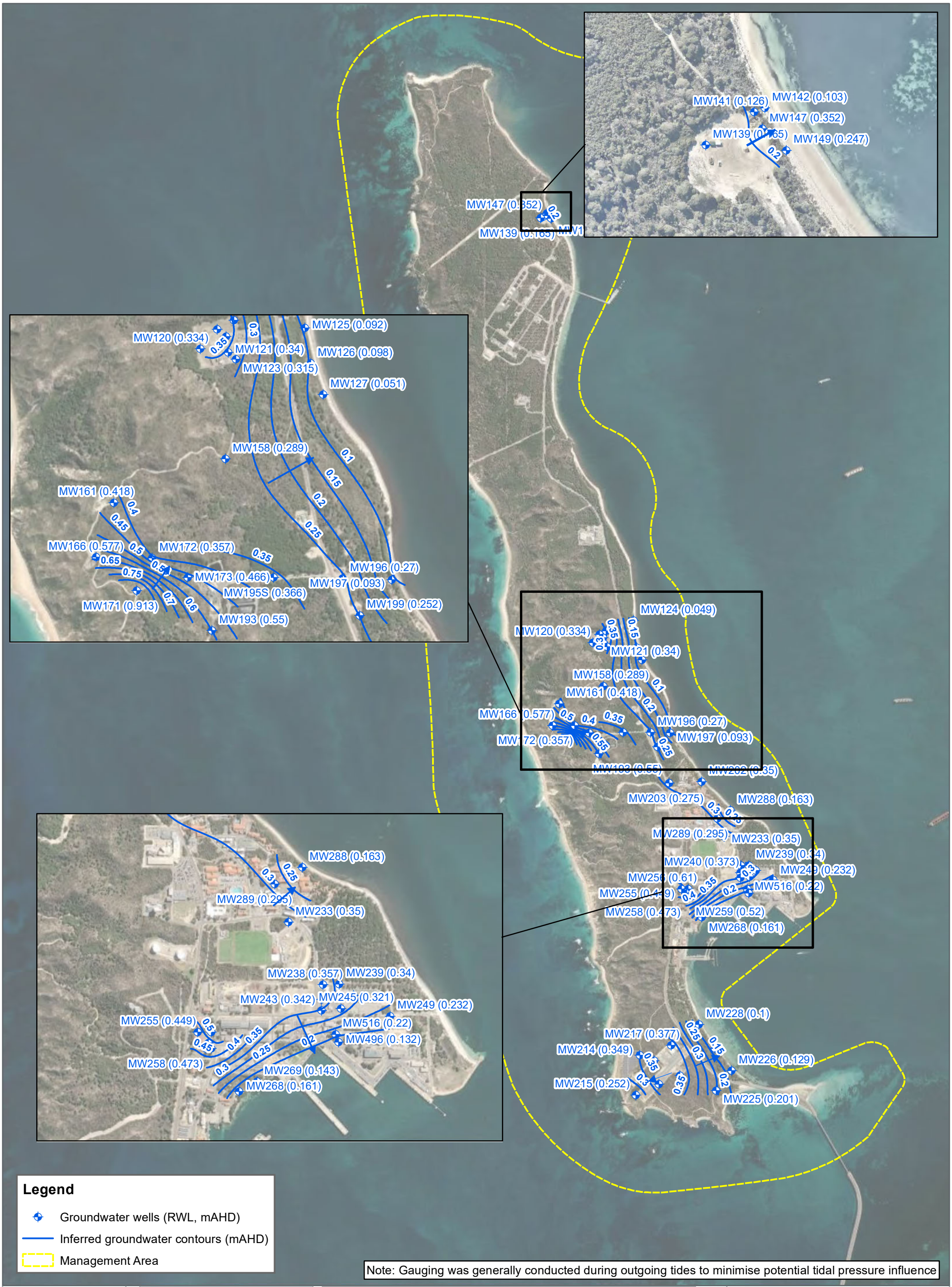
Sediment Results

Q1 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-03-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005B_2023Q1_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap



Legend

- Groundwater wells (RWL, mAHD)
- Inferred groundwater contours (mAHD)
- Management Area

Note: Gauging was generally conducted during outgoing tides to minimise potential tidal pressure influence

FIGURE 6

1:32,000 Scale at A3

Metres

0 500 1,000

Inferred Groundwater Contours

Q1 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-03-31 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2023Q1_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

APPENDIX

B

DATA ASSESSMENT TABLES

Cardno

now

Stantec

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorote	
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05
PFAS NEMP 2020 Drinking Water																*0.56*								
PFAS NEMP 2020 Interim Marine 99%										0.00023*														
PFAS NEMP 2020 Recreational Water																**10**								
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																			
		13/03/2023	0089_QC301_230313	Rinsate	EP2303119	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		13/03/2023	0089_QC302_230313	Rinsate	EP2303119	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		13/03/2023	0089_QC303_230313	Rinsate	EP2303119	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		13/03/2023	0089_QC401_230313	Field Blank	EP2303119	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		13/03/2023	0089_QC402_230313	Field Blank	EP2303119	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		13/03/2023	0089_QC403_230313	Field Blank	EP2303119	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		14/03/2023	0089_QC301_230314	Rinsate	EP2303178	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		14/03/2023	0089_QC302_230314	Rinsate	EP2303178	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		14/03/2023	0089_QC401_230314	Field Blank	EP2303178	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		14/03/2023	0089_QC402_230314	Field Blank	EP2303178	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		15/03/2023	0089_QC301_230315	Rinsate	EP2303227	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		15/03/2023	0089_QC302_230315	Rinsate	EP2303227	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		15/03/2023	0089_QC303_230315	Rinsate	EP2303227	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		15/03/2023	0089_QC401_230315	Field Blank	EP2303227	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		15/03/2023	0089_QC402_230315	Field Blank	EP2303227	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
		15/03/2023	0089_QC403_230315	Field Blank	EP2303227	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	MW109	13/03/2023	0089_MW109_230313	Normal	EP2303119	0.14	0.22	1.66	0.04	0.44	<0.02	0.1	0.03	0.27	0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	MW109	13/03/2023	0089_QC107_230313	Field Duplicate	EP2303119	0.14	0.20	1.34	0.04	0.42	<0.02	0.1	0.02	0.24	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	MW109	13/03/2023	0089_QC207_230313	Interlab Duplicate	972487	0.13	0.24	1.3	0.03	0.44	<0.01	0.13	0.03	0.21	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
FTA	MW112	13/03/2023	0089_MW112_230313	Normal	EP2303119	0.06	0.16	5.94	2.62	15.8	<0.02	0.1	0.22	1.00	0.42	*1.72*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.13
FTA	MW120	13/03/2023	0089_MW120_230313	Normal	EP2303119	0.02	0.03	4.24	3.26	0.55	<0.02	<0.1	<0.02	0.10	<0.02	*1.47*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	MW120	13/03/2023	0089_QC105_230313	Field Duplicate	EP2303119	<0.02	0.02	4.71	1.38	0.78	<0.02	<0.1	<0.02	0.10	<0.02	*0.69*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	MW120	13/03/2023	0089_QC205_230313	Interlab Duplicate	972487	0.02	0.04	5.2	1.1	0.99	<0.01	<0.05	0.02	0.09	0.01	*0.98*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
FTA	MW121	13/03/2023	0089_MW121_230313	Normal	EP2303119	0.02	<0.02	0.38	0.02	0.08	<0.02	<0.1	0.02	0.07	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	MW123	13/03/2023	0089_MW123_230313	Normal	EP2303119	0.31	0.28	2.24	<0.02	0.03	<0.02	<0.1	0.05	0.31	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	MW123	13/03/2023	0089_QC101_230313	Field Duplicate	EP2303119	0.31	0.28	1.85	<0.02	0.03	<0.02	<0.1	0.05	0.26	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	MW123	13/03/2023	0089_QC201_230313	Interlab Duplicate	972487	0.33	0.33	2.1	<0.01	0.03	<0.01	0.06	0.05	0.28	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
FTA	MW124	13/03/2023	0089_MW124_230313	Normal	EP2303085	0.03	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	MW125	13/03/2023	0089_MW125_230313	Normal	EP2303085	0.20	0.21	0.75	<0.02	<0.01	<0.02	<0.1	0.03	0.23	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	MW126	13/03/2023	0089_MW126_230313	Normal	EP2303085	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	MW126	13/03/2023	0089_QC110_230313	Field Duplicate	EP2303085	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	MW126	13/03/2023	0089_QC210_230313	Interlab Duplicate	972487	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
FTA	MW127	13/03/2023	0089_MW127_230313	Normal	EP2303085	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	MW139	15/03/2023	0089_MW139_230315	Normal	EP2303226	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	MW141	15/03/2023	0089_MW141_230315	Normal	EP2303226	0.47	0.91	19.1	1.32	72.5	<0.02	0.3	1.20	12.2	0.34	*1.43*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	MW142	15/03/2023	0089_MW142_230315	Normal	EP2303226	0.14	0.26	4.45	0.14	3.07	<0.02	<0.1	0.32	3.31	0.08	0.29	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	MW147	15/03/2023	0089_MW147_230315	Normal	EP2303226	<0.02	<0.02	0.08	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	MW149	15/03/2023	0089_MW149_230315	Normal	EP2303226	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW158	13/03/2023	0089_MW158_230313	Normal	EP2303084	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW161	13/03/2023	0089_MW161_230313	Normal	EP2303084	<0.02	<0.02	0.18	0.03	2.85	<0.02	<0.1	0.04	0.04	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW166	13/03/2023	0089_MW166_230313	Normal	EP2303084	0.04	0.03	0.86	0.17	3.85	<0.02	0.1	0.25	0.23	0.13	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW171	13/03/2023	0089_MW171_230313	Normal	EP2303084	0.10	0.04	0.20	<0.02	0.02	<0.02	<0.1	0.04	0.12	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW171	13/03/2023	0089_QC103_230313	Field Duplicate	EP2303084	0.03	<0.02	0.07	<0.02	<0.01	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW171	13/03/2023	0089_QC203_230313	Interlab Duplicate	972487	0.02	<0.01	0.05	<0.01	<0.01	<0.01	<0.05	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
WWTP	MW172	13/03/2023	0089_MW172_230313	Normal	EP2303084	1.33	0.54	8.48	2.31	9.34	<0.02	0.6	0.42	2.05	0.16	0.48	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW173	13/03/2023	0089_MW173_230313	Normal	EP2303084	0.19	0.09	2.24	0.40	4.20	<0.02	<0.1	0.09	0.31	0.04	0.23	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW193	13/03/2023	0089_MW193_230313	Normal	EP2303084	0.56	0.51	6.53	0.49	1.67	<0.02	0.1	0.20	1.07	0.10	0.39	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW195D	13/03/2023	0089_MW195D_230313	Normal	EP2303084	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	0.08	0.07	0.10	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW195S	13/03/2023	0089_MW195S_230313	Normal	EP2303084	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW195S	13/03/2023	0089_QC113_230313	Field Duplicate	EP2303084	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW195S	13/03/2023	0089_QC213_230313	Interlab Duplicate	972487	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
WWTP	MW196	13/03/2023	0089_MW196_230313	Normal	EP2303119	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW197	14/03/2023	0089_MW197_230314	Normal	EP2303177	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW199	13/03/2023	0089_MW199_230313	Normal	EP2303084	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW199	13/03/2023	0089_QC111_230313	Field Duplicate	EP2303084	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW199	13/03/2023	0089_QC211_230313	Interlab Duplicate	972487	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
WWTP	MW200	14/03/2023	0089_MW200_230314	Normal	EP2303177	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW202	13/03/2023	0089_MW202_230313	Normal	EP2303085	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP	MW203	13/03/2023	0089_MW203_230313	Normal	EP2303085	0.02	<0.02	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	MW214	14/03/2023	0089_MW214_230314	Normal	EP2303177	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	MW215	14/03/2023	0089_MW215_230314	Normal	EP2303177	0.04	0.06	0.45	<0.02	<0.01	<0.02	<0.1	0.04	0.12	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	MW216	14/03/2023	0089_MW216_230314	Normal	EP2303177	0.20	0.25	2.12	0.07	0.50	<0.02	4.1	15.5	7.54	0.38	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.37
HSF	MW217	15/03/2023	0089_MW217_230315	Normal	EP2303198	0.03	0.03	0.02	<0.02	0.03	<0.02	1.9	8.73	9.30	0.90	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	21.0
HSF	MW220	15/03/2023	0089_MW220_230315	Normal	EP2303198	0.06	0.05	0.66	0.10	12.0	<0.02	0.2	0.21	0.27	0.07	0.10	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	MW224	15/03/2023	0089_MW224_230315	Normal	EP2303198	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	MW225	14/03/2023	0089_MW225_230314	Normal	EP2303177	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	MW226	14/03/2023	0089_MW226_230314	Normal	EP2303178	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	MW227	14/03/2023	0089_MW227_230314	Normal	EP2303178	0.06	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	MW228	14/03/2023	0089_MW228_230314	Normal	EP2303178	0.16	0.12	0.19	<0.02	<0.01	<0.02	1.4	4.84	5.00	1.18	0.23	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.91
AVCAT Storage and Fuel Farm	MW233	13/03/2023	0089_MW233_230313	Normal	EP2303119	<0.02	<0.02	0.03	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	MW238	15/03/2023	0089_MW238_230315	Normal	EP2303198	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	MW239	15/03/2023	0089_MW239_230315	Normal	EP2303198	<0.02	<0.02	0.11	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	MW240	15/03/2023	0089_MW240_230315	Normal	EP2303198	<0.02	0.16	4.45	0.14	<0.01	<0.02	<0.1	0.02	0.15	0.04	0.19	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	MW242	15/03/2023	0089_MW242_230315	Normal	EP2303198	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	MW243	15/03/2023	0089_MW243_230315	Normal	EP2303198	<0.02	<0.02	0.09	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	MW245	15/03/2023	0089_MW245_230315	Normal	EP2303198	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05

Table 1 - Water samples analytical results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorote	
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05
PFAS NEMP 2020 Drinking Water																*0.56*								
PFAS NEMP 2020 Interim Marine 99%										0.00023*														
PFAS NEMP 2020 Recreational Water																**10**								
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																			
AVCAT Storage and Fuel Farm	**MW249**	**13/03/2023**	**0089_MW249_230313**	**Normal**	**EP2303119**	<0.02	<0.02	0.23	<0.02	0.05	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Fire Station, Flammable/Hazardous	**MW255**	**13/03/2023**	**0089_MW255_230313**	**Normal**	**EP2303119**	0.44	0.32	5.23	<0.02	0.34	<0.02	0.1	0.21	1.08	0.12	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Fire Station, Flammable/Hazardous	**MW256**	**13/03/2023**	**0089_MW256_230313**	**Normal**	**EP2303119**	1.51	0.93	6.48	0.18	5.19	<0.02	0.6	0.86	3.40	0.27	0.36	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.15
Fire Station, Flammable/Hazardous	**MW257**	**13/03/2023**	**0089_MW257_230313**	**Normal**	**EP2303119**	<0.02	<0.02	1.10	<0.02	0.04	<0.02	<0.1	0.15	0.12	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Fire Station, Flammable/Hazardous	**MW258**	**13/03/2023**	**0089_MW258_230313**	**Normal**	**EP2303119**	5.41	3.78	7.56	0.50	4.65	<0.02	1.5	2.82	4.09	0.71	0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.22
Fire Station, Flammable/Hazardous	**MW259**	**13/03/2023**	**0089_MW259_230313**	**Normal**	**EP2303119**	<0.02	<0.02	0.03	<0.02	0.12	<0.02	<0.1	0.14	0.11	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**MW268**	**15/03/2023**	**0089_MW268_230315**	**Normal**	**EP2303198**	0.05	0.05	0.32	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**MW269**	**15/03/2023**	**0089_MW269_230315**	**Normal**	**EP2303198**	0.06	0.08	0.33	<0.02	0.34	<0.02	<0.1	0.02	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**MW282**	**15/03/2023**	**0089_MW282_230315**	**Normal**	**EP2303198**	2.85	6.23	59.4	6.22	47.9	<0.02	1.4	2.02	9.52	3.50	*8.27*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.06
Accomodation Area	**MW288**	**14/03/2023**	**0089_MW288_230314**	**Normal**	**EP2303178**	<0.02	<0.02	0.02	<0.02	1.25	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Accomodation Area	**MW289**	**14/03/2023**	**0089_MW289_230314**	**Normal**	**EP2303178**	0.05	0.07	1.06	0.05	1.78	<0.02	<0.1	<0.02	0.06	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW496**	**13/03/2023**	**0089_MW496_230313**	**Normal**	**EP2303119**	0.05	0.07	1.20	0.11	6.29	<0.02	<0.1	<0.02	0.16	0.03	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**MW500**	**13/03/2023**	**0089_MW500_230313**	**Normal**	**EP2303119**	0.43	0.70	12.0	4.93	26.1	<0.02	0.3	0.49	2.54	0.42	*2.12*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.11
AVCAT Storage and Fuel Farm	**MW516**	**13/03/2023**	**0089_MW516_230313**	**Normal**	**EP2303119**	<0.02	0.02	0.52	0.07	5.40	<0.02	<0.1	<0.02	0.06	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (East)	**PW304**	**13/03/2023**	**0089_PW304_230313**	**Normal**	**EP2303086**	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (East)	**PW304**	**13/03/2023**	**0089_QC115_230313**	**Field Duplicate**	**EP2303086**	<0.02	<0.02	0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (East)	**PW304**	**13/03/2023**	**0089_QC215_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	0.01	<0.01	0.07	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
HSF	**PW306**	**14/03/2023**	**0089_PW306_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**PW307**	**14/03/2023**	**0089_PW307_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**PW308**	**14/03/2023**	**0089_PW308_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**PW314**	**14/03/2023**	**0089_PW314_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**PW315**	**14/03/2023**	**0089_PW315_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**PW316**	**14/03/2023**	**0089_PW316_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	**PW329**	**15/03/2023**	**0089_PW329_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	**PW330**	**15/03/2023**	**0089_PW330_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	**PW331**	**15/03/2023**	**0089_PW331_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**PW335**	**13/03/2023**	**0089_PW335_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.14	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**PW340**	**13/03/2023**	**0089_PW340_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**PW341**	**13/03/2023**	**0089_PW341_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (East)	**PW345**	**14/03/2023**	**0089_PW345_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Accomodation Area	**PW346**	**14/03/2023**	**0089_PW346_230314**	**Normal**	**EP2303179**	<0.02	<0.02	0.01	<0.02	0.22	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Accomodation Area	**PW346**	**14/03/2023**	**0089_QC118_230314**	**Field Duplicate**	**EP2303179**	<0.02	<0.02	0.02	<0.02	0.41	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Accomodation Area	**PW346**	**14/03/2023**	**0089_QC218_230314**	**Interlab Duplicate**	**972487**	<0.01	<0.01	0.02	<0.01	0.28	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
WWTP (West)	**PW350**	**15/03/2023**	**0089_PW350_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (West)	**PW351**	**15/03/2023**	**0089_PW351_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (West)	**PW352**	**15/03/2023**	**0089_PW352_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	**PW356**	**15/03/2023**	**0089_PW356_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	**PW357**	**15/03/2023**	**0089_PW357_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**PW358**	**15/03/2023**	**0089_PW358_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**PW362**	**13/03/2023**	**0089_PW362_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**PW362**	**13/03/2023**	**0089_QC109_230313**	**Field Duplicate**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**PW362**	**13/03/2023**	**0089_QC209_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
FTA	**PW363**	**13/03/2023**	**0089_PW363_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**PW364**	**13/03/2023**	**0089_PW364_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**PW364**	**13/03/2023**	**0089_QC106_230313**	**Field Duplicate**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**PW364**	**13/03/2023**	**0089_QC206_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
WWTP (East)	**PW367**	**14/03/2023**	**0089_PW367_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (East)	**PW368**	**13/03/2023**	**0089_PW368_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (East)	**PW369**	**14/03/2023**	**0089_PW369_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW374**	**14/03/2023**	**0089_PW374_230314**	**Normal**	**EP2303179**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW375**	**14/03/2023**	**0089_PW375_230314**	**Normal**	**EP2303179**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW378**	**14/03/2023**	**0089_PW378_230314**	**Normal**	**EP2303179**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (West)	**PW380**	**15/03/2023**	**0089_PW380_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (West)	**PW381**	**15/03/2023**	**0089_PW381_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (West)	**PW401**	**15/03/2023**	**0089_PW401_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**PW405**	**14/03/2023**	**0089_PW405_230314**	**Normal**	**EP2303179**	<0.02	0.08	0.01	<0.02	<0.01	<0.02	<0.1	0.16	0.50	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**PW407**	**14/03/2023**	**0089_PW407_230314**	**Normal**	**EP2303179**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**PW409**	**14/03/2023**	**0089_PW409_230314**	**Normal**	**EP2303179**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**PW411**	**15/03/2023**	**0089_PW411_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**PW413**	**15/03/2023**	**0089_PW413_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**PW415**	**15/03/2023**	**0089_PW415_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**SW130**	**13/03/2023**	**0089_QC102_230313**	**Field Duplicate**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**SW130**	**13/03/2023**	**0089_QC202_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
FTA	**SW130**	**13/03/2023**	**0089_SW130_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**SW132**	**13/03/2023**	**0089_SW132_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
FTA	**SW134**	**13/03/2023**	**0089_SW134_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	**SW150**	**15/03/2023**	**0089_SW150_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	**SW152**	**15/03/2023**	**0089_SW152_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	**SW154**	**15/03/2023**	**0089_SW154_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Demolition Ground	**SW156**	**15/03/2023**	**0089_SW156_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (East)	**SW305**	**13/03/2023**	**0089_QC114_230313**	**Field Duplicate**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (East)	**SW305**	**13/03/2023**	**0089_QC214_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
WWTP (East)	**SW305**	**13/03/2023**	**0089_SW305_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**SW309**	**14/03/2023**	**0089_SW309_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**SW310**	**14/03/2023**	**0089_SW310_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**SW311**	**14/03/2023**	**0089_SW311_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**SW317**	**14/03/2023**	**0089_SW317_230314**	**Normal**	**EP2303179**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**SW318**	**14/03/2023**	**0089_SW318_230314**	**Normal**	**EP2303179**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05

Table 1 - Water samples analytical results

								PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorote	
								Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)
								µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting								0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05
PFAS NEMP 2020 Drinking Water																		*0.56*								
PFAS NEMP 2020 Interim Marine 99%												0.00023*														
PFAS NEMP 2020 Recreational Water																		**10**								
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																					
Dredge Spoil / Careening Bay	**SW319**	**14/03/2023**	**0089_SW319_230314**	**Normal**	**EP2303179**			<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (West)	**SW353**	**15/03/2023**	**0089_SW353_230315**	**Normal**	**EP2303229**			<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (East)	**SW370**	**14/03/2023**	**0089_SW370_230314**	**Normal**	**EP2303175**			<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (East)	**SW371**	**13/03/2023**	**0089_SW371_230313**	**Normal**	**EP2303086**			<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (East)	**SW372**	**14/03/2023**	**0089_SW372_230314**	**Normal**	**EP2303179**			<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (West)	**SW373**	**14/03/2023**	**0089_QC116_230314**	**Field Duplicate**	**EP2303179**			<0.02	<0.02	0.02	<0.02	0.13	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (West)	**SW373**	**14/03/2023**	**0089_QC216_230314**	**Interlab Duplicate**	**972487**			<0.01	<0.01	0.02	<0.01	0.14	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
WWTP (West)	**SW373**	**14/03/2023**	**0089_SW373_230314**	**Normal**	**EP2303179**			<0.02	<0.02	0.02	<0.02	0.13	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (West)	**SW382**	**15/03/2023**	**0089_SW382_230315**	**Normal**	**EP2303229**			<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (West)	**SW383**	**15/03/2023**	**0089_SW383_230315**	**Normal**	**EP2303229**			<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
WWTP (West)	**SW384**	**15/03/2023**	**0089_SW384_230315**	**Normal**	**EP2303229**			<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**SW406**	**14/03/2023**	**0089_SW406_230314**	**Normal**	**EP2303179**			<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**SW408**	**14/03/2023**	**0089_SW408_230314**	**Normal**	**EP2303179**			<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**SW410**	**14/03/2023**	**0089_SW410_230314**	**Normal**	**EP2303179**			<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**SW412**	**15/03/2023**	**0089_SW412_230315**	**Normal**	**EP2303229**			<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**SW414**	**15/03/2023**	**0089_SW414_230315**	**Normal**	**EP2303229**			<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
HSF	**SW416**	**15/03/2023**	**0089_SW416_230315**	**Normal**	**EP2303229**			<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water

HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%

HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First-time detection of PFOA or PFHxS+PFOS

New exceedance of guideline value

						lomer Sulfonic Acids		PFAS - Perfluoroalkyl Sulfonamides							PFAS			Inorganics						
						8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L
LOR - Limit of Reporting						0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1	1	1	1	0.01	0.01	1
PFAS NEMP 2020 Drinking Water															*0.07*									
PFAS NEMP 2020 Interim Marine 99%																								
PFAS NEMP 2020 Recreational Water															**2**									
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																			
		13/03/2023	0089_QC301_230313	Rinsate	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		13/03/2023	0089_QC302_230313	Rinsate	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		13/03/2023	0089_QC303_230313	Rinsate	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		13/03/2023	0089_QC401_230313	Field Blank	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		13/03/2023	0089_QC402_230313	Field Blank	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		13/03/2023	0089_QC403_230313	Field Blank	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		14/03/2023	0089_QC301_230314	Rinsate	EP2303178	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		14/03/2023	0089_QC302_230314	Rinsate	EP2303178	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		14/03/2023	0089_QC401_230314	Field Blank	EP2303178	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		14/03/2023	0089_QC402_230314	Field Blank	EP2303178	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		15/03/2023	0089_QC301_230315	Rinsate	EP2303227	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		15/03/2023	0089_QC302_230315	Rinsate	EP2303227	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		15/03/2023	0089_QC303_230315	Rinsate	EP2303227	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		15/03/2023	0089_QC401_230315	Field Blank	EP2303227	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		15/03/2023	0089_QC402_230315	Field Blank	EP2303227	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
		15/03/2023	0089_QC403_230315	Field Blank	EP2303227	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01							
FTA	MW109	13/03/2023	0089_MW109_230313	Normal	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.10***	2.70	2.96	<1	479	<1	479	16.1	13.8	214
FTA	MW109	13/03/2023	0089_QC107_230313	Field Duplicate	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.76*	2.30	2.54							
FTA	MW109	13/03/2023	0089_QC207_230313	Interlab Duplicate	972487	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*1.74*	2.29	2.58							
FTA	MW112	13/03/2023	0089_MW112_230313	Normal	EP2303119	<0.05	<0.05	0.38	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***21.7***	25.4	28.6	<1	233	<1	233	5.84	5.20	31
FTA	MW120	13/03/2023	0089_MW120_230313	Normal	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.79***	6.38	9.67	<1	258	<1	258	7.40	6.58	64
FTA	MW120	13/03/2023	0089_QC105_230313	Field Duplicate	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.49***	6.28	7.68							
FTA	MW120	13/03/2023	0089_QC205_230313	Interlab Duplicate	972487	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***6.19***	7.31	8.45							
FTA	MW121	13/03/2023	0089_MW121_230313	Normal	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.46*	0.60	0.62	<1	262	<1	262	6.34	5.66	34
FTA	MW123	13/03/2023	0089_MW123_230313	Normal	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.27***	2.97	3.25	<1	670	<1	670	24.9	22.2	395
FTA	MW123	13/03/2023	0089_QC101_230313	Field Duplicate	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.88*	2.52	2.80	<1	744	<1	744	27.0	23.7	416
FTA	MW123	13/03/2023	0089_QC201_230313	Interlab Duplicate	972487	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***2.13***	2.87	3.28							
FTA	MW124	13/03/2023	0089_MW124_230313	Normal	EP2303085	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.03	0.03	<1	346	<1	346	502	435	16,100
FTA	MW125	13/03/2023	0089_MW125_230313	Normal	EP2303085	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.75*	1.21	1.42	<1	379	<1	379	524	445	16,800
FTA	MW126	13/03/2023	0089_MW126_230313	Normal	EP2303085	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	655	<1	655	538	446	17,400
FTA	MW126	13/03/2023	0089_QC110_230313	Field Duplicate	EP2303085	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	648	<1	648	482	411	15,400
FTA	MW126	13/03/2023	0089_QC210_230313	Interlab Duplicate	972487	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1							
FTA	MW127	13/03/2023	0089_MW127_230313	Normal	EP2303085	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	528	<1	528	464	399	14,800
Demolition Ground	MW139	15/03/2023	0089_MW139_230315	Normal	EP2303226	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	228	<1	228	45.3	44.5	1,340
Demolition Ground	MW141	15/03/2023	0089_MW141_230315	Normal	EP2303226	<0.05	<0.05	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***91.6***	108	110	<1	599	<1	599	265	285	8,340
Demolition Ground	MW142	15/03/2023	0089_MW142_230315	Normal	EP2303226	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.52***	11.7	12.1	<1	376	<1	376	335	380	10,500
Demolition Ground	MW147	15/03/2023	0089_MW147_230315	Normal	EP2303226	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	0.10	<1	454	<1	454	310	325	9,790
Demolition Ground	MW149	15/03/2023	0089_MW149_230315	Normal	EP2303226	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	200	<1	200	479	533	15,200
WWTP	MW158	13/03/2023	0089_MW158_230313	Normal	EP2303084	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	432	<1	432	142	136	4,380
WWTP	MW161	13/03/2023	0089_MW161_230313	Normal	EP2303084	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.03***	3.15	3.18	<1	490	<1	490	31.3	27.1	600
WWTP	MW166	13/03/2023	0089_MW166_230313	Normal	EP2303084	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.71***	5.55	5.75	<1	353	<1	353	35.7	35.0	888
WWTP	MW171	13/03/2023	0089_MW171_230313	Normal	EP2303084	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.22*	0.51	0.55	<1	465	<1	465	165	158	5,080
WWTP	MW171	13/03/2023	0089_QC103_230313	Field Duplicate	EP2303084	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.14	0.14	<1	465	<1	465	168	156	5,200
WWTP	MW171	13/03/2023	0089_QC203_230313	Interlab Duplicate	972487	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	0.11	0.13							
WWTP	MW172	13/03/2023	0089_MW172_230313	Normal	EP2303084	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***17.8***	22.9	25.7	<1	446	<1	446	52.5	50.3	1,360
WWTP	MW173	13/03/2023	0089_MW173_230313	Normal	EP2303084	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.44***	7.30	7.79	<1	393	<1	393	36.6	33.9	930
WWTP	MW193	13/03/2023	0089_MW193_230313	Normal	EP2303084	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.20***	10.6	11.6	<1	670	<1	670	36.5	30.2	693
WWTP	MW195D	13/03/2023	0089_MW195D_230313	Normal	EP2303084	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.28	0.28	<1	281	<1	281	268	239	8,390
WWTP	MW195S	13/03/2023	0089_MW195S_230313	Normal	EP2303084	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	618	<1	618	42.4	37.8	868
WWTP	MW195S	13/03/2023	0089_QC113_230313	Field Duplicate	EP2303084	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	713	<1	713	45.9	39.0	920
WWTP	MW195S	13/03/2023	0089_QC213_230313	Interlab Duplicate	972487	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1							
WWTP	MW196	13/03/2023	0089_MW196_230313	Normal	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	219	<1	219	5.81	5.56	36
WWTP	MW197	14/03/2023	0089_MW197_230314	Normal	EP2303177	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	437	<1	437	31.9	30.2	744
WWTP	MW199	13/03/2023	0089_MW199_230313	Normal	EP2303084	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	440	<1	440	97.2	91.1	2,940
WWTP	MW199	13/03/2023	0089_QC111_230313	Field Duplicate	EP2303084	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	438	<1	438	106	94.7	3,220
WWTP	MW199	13/03/2023	0089_QC211_230313	Interlab Duplicate	972487	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1							
WWTP	MW200	14/03/2023	0089_MW200_230314	Normal	EP2303177	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	421	<1	421	67.3	69.1	1,940
WWTP	MW202	13/03/2023	0089_MW202_230313	Normal	EP2303085	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	200	<1	200	9.93	11.8	161
WWTP	MW203	13/03/2023	0089_MW203_230313	Normal	EP2303085	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.06	0.06	8	318	<1	326	12.6	12.0	90
HSF	MW214	14/03/2023	0089_MW214_230314	Normal	EP2303177	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	430	<1	430	78.8	74.9	2,450
HSF	MW215	14/03/2023	0089_MW215_230314	Normal	EP2303177	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.45*	0.67	0.73	<1	291	<1	291	19.2	17.1	408
HSF	MW216	14/03/2023	0089_MW216_230314	Normal	EP2303177	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.62***	31.9	32.2	<1	285	<1	285	37.1	37.7	957
HSF	MW217	15/03/2023	0089_MW217_230315	Normal	EP2303198	0.21	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	42.5	42.5	<1	277	<1	277	8.40	8.97	50
HSF	MW220	15/03/2023	0089_MW220_230315	Normal	EP2303198	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***12.7***	13.6	13.8	<1	280	<1	280	7.61	7.08	50
HSF	MW224	15/03/2023	0089_MW224_230315	Normal	EP2303198	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	261	<1	261	9.48	8.01	110
HSF	MW225	14/03/2023	0089_MW225_230314	Normal	EP2303177	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	352	<1	352	22.2	18.6	493
HSF	MW226	14/03/2023	0089_MW226_230314	Normal	EP2303178	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	595	<1	595	446	410	13,800
HSF	MW227	14/03/2023	0089_MW227_230314	Normal	EP2303178	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.06	0.06	<1	412	<1	412	33.3	30.2	713
HSF	MW228	14/03/2023	0089_MW228_230314	Normal	EP2303178	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.19*	13.9	14.0	<1	603	<1	603	156	155	4,540
AVCAT Storage and Fuel Farm	MW233	13/03/2023	0089_MW233_230313	Normal	EP2303119	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.12*	0.12	0.12	<1	118	<1	118	3.39	3.31	33
AVCAT Storage and Fuel Farm	MW238	15/03/2023	0089_MW238_230315	Normal	EP2303198	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	208	<1	208	6.76	6.95	42
AVCAT Storage and Fuel Farm	MW239	15/03/2023	0089_MW239_230315	Normal	EP2303198	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.21*	0.21	0.21	<1	296	<1	296	8.02	6.65	48
AVCAT Storage and Fuel Farm	MW240	15/03/2023	0089_MW240_230315	Normal	EP2303198	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.45***	4.85	5.15	<1	260	<1	260	7.91	7.51	57
AVCAT Storage and Fuel Farm	MW242	15/03/2023	0089_MW242_230315	Normal	EP2303198	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	182	<1	182	4.61	3.88	16
AVCAT Storage and Fuel Farm	MW243	15/03/2023	0089_MW243_230315	Normal	EP2303198	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09	<1	285	<1	285	9.41	8.89	72
AVCAT Storage and Fuel Farm	MW245	15/03/2023	0089_MW245_230315	Normal	EP2303198	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	256	<1	256	6.07	5.08	34

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Table 1 - Water samples analytical results

PFAS OMP
HMAS Stirling Q1 2023

						Fluorotelomer Sulfonic Acids		PFAS - Perfluoroalkyl Sulfonamides							PFAS			Inorganics						
						8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L
LOR - Limit of Reporting						0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1	1	1	1	0.01	0.01	1
PFAS NEMP 2020 Drinking Water															*0.07*									
PFAS NEMP 2020 Interim Marine 99%																								
PFAS NEMP 2020 Recreational Water															**2**									
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																			
AVCAT Storage and Fuel Farm	**MW249**	**13/03/2023**	**0089_MW249_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.28*	0.30	0.30	<1	436	<1	436	14.4	12.4	151
Fire Station, Flammable/Hazardous	**MW255**	**13/03/2023**	**0089_MW255_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.57***	7.54	7.86	<1	262	<1	262	8.16	7.41	66
Fire Station, Flammable/Hazardous	**MW256**	**13/03/2023**	**0089_MW256_230313**	**Normal**	**EP2303119**	<0.05	<0.05	0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***11.7***	18.8	20.0	<1	506	<1	506	19.8	16.7	299
Fire Station, Flammable/Hazardous	**MW257**	**13/03/2023**	**0089_MW257_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.14*	1.45	1.45	<1	222	<1	222	5.83	5.42	37
Fire Station, Flammable/Hazardous	**MW258**	**13/03/2023**	**0089_MW258_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***12.2***	27.5	31.7	<1	397	<1	397	14.4	13.0	156
Fire Station, Flammable/Hazardous	**MW259**	**13/03/2023**	**0089_MW259_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.15*	0.40	0.40	<1	234	<1	234	5.28	4.61	14
Dredge Spoil / Careening Bay	**MW268**	**15/03/2023**	**0089_MW268_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.32*	0.43	0.48	<1	460	<1	460	78.1	73.8	1,930
Dredge Spoil / Careening Bay	**MW269**	**15/03/2023**	**0089_MW269_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.67*	0.82	0.90	<1	392	<1	392	18.0	15.7	272
HSF	**MW282**	**15/03/2023**	**0089_MW282_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***107***	135	147	<1	517	<1	517	12.4	12.3	55
Accomodation Area	**MW288**	**14/03/2023**	**0089_MW288_230314**	**Normal**	**EP2303178**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.27*	1.27	1.27	<1	335	<1	335	8.94	7.60	59
Accomodation Area	**MW289**	**14/03/2023**	**0089_MW289_230314**	**Normal**	**EP2303178**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.84***	3.00	3.12	<1	402	<1	402	13.6	12.0	122
AVCAT Storage and Fuel Farm	**MW496**	**13/03/2023**	**0089_MW496_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.49***	7.82	8.00	<1	391	<1	391	17.0	14.2	256
FTA	**MW500**	**13/03/2023**	**0089_MW500_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***38.1***	44.5	50.2	<1	386	<1	386	10.6	8.84	65
AVCAT Storage and Fuel Farm	**MW516**	**13/03/2023**	**0089_MW516_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.92***	6.03	6.12	<1	454	<1	454	11.2	9.78	62
WWTP (East)	**PW304**	**13/03/2023**	**0089_PW304_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	150	<1	150	657	710	21,000
WWTP (East)	**PW304**	**13/03/2023**	**0089_QC115_230313**	**Field Duplicate**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	151	<1	151	672	704	21,500
WWTP (East)	**PW304**	**13/03/2023**	**0089_QC215_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.08*	0.08	<0.1							
HSF	**PW306**	**14/03/2023**	**0089_PW306_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	158	<1	158	618	678	19,700
HSF	**PW307**	**14/03/2023**	**0089_PW307_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	624	684	20,000
HSF	**PW308**	**14/03/2023**	**0089_PW308_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	136	<1	136	620	683	19,900
HSF	**PW314**	**14/03/2023**	**0089_PW314_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	146	<1	146	624	673	19,900
HSF	**PW315**	**14/03/2023**	**0089_PW315_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	182	<1	182	638	654	20,400
HSF	**PW316**	**14/03/2023**	**0089_PW316_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	636	682	20,400
Demolition Ground	**PW329**	**15/03/2023**	**0089_PW329_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	615	675	19,600
Demolition Ground	**PW330**	**15/03/2023**	**0089_PW330_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	134	<1	134	594	679	18,900
Demolition Ground	**PW331**	**15/03/2023**	**0089_PW331_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	152	<1	152	719	687	23,300
FTA	**PW335**	**13/03/2023**	**0089_PW335_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.14*	0.14	0.14	<1	159	<1	159	722	796	23,100
FTA	**PW340**	**13/03/2023**	**0089_PW340_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	235	<1	235	727	764	23,200
FTA	**PW341**	**13/03/2023**	**0089_PW341_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	129	<1	129	641	682	20,500
WWTP (East)	**PW345**	**14/03/2023**	**0089_PW345_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	191	<1	191	700	768	22,300
Accomodation Area	**PW346**	**14/03/2023**	**0089_PW346_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.23*	0.23	0.23	<1	681	<1	681	674	727	21,400
Accomodation Area	**PW346**	**14/03/2023**	**0089_QC118_230314**	**Field Duplicate**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.43*	0.43	0.43	<1	672	<1	672	681	728	21,600
Accomodation Area	**PW346**	**14/03/2023**	**0089_QC218_230314**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.3*	0.3	0.3							
WWTP (West)	**PW350**	**15/03/2023**	**0089_PW350_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	125	<1	125	642	664	20,100
WWTP (West)	**PW351**	**15/03/2023**	**0089_PW351_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	122	<1	122	644	668	20,700
WWTP (West)	**PW352**	**15/03/2023**	**0089_PW352_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	122	<1	122	645	684	20,700
Demolition Ground	**PW356**	**15/03/2023**	**0089_PW356_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	158	<1	158	608	669	19,400
Demolition Ground	**PW357**	**15/03/2023**	**0089_PW357_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	138	<1	138	612	663	19,500
FTA	**PW358**	**15/03/2023**	**0089_PW358_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	596	668	19,000
FTA	**PW362**	**13/03/2023**	**0089_PW362_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	194	<1	194	758	797	24,200
FTA	**PW362**	**13/03/2023**	**0089_QC109_230313**	**Field Duplicate**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	198	<1	198	712	775	22,700
FTA	**PW362**	**13/03/2023**	**0089_QC209_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1							
FTA	**PW363**	**13/03/2023**	**0089_PW363_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	158	<1	158	720	785	23,000
FTA	**PW364**	**13/03/2023**	**0089_PW364_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	190	<1	190	726	791	23,200
FTA	**PW364**	**13/03/2023**	**0089_QC106_230313**	**Field Duplicate**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	191	<1	191	724	773	23,100
FTA	**PW364**	**13/03/2023**	**0089_QC206_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.01	<0.05	<0.1							
WWTP (East)	**PW367**	**14/03/2023**	**0089_PW367_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	219	<1	219	685	682	22,000
WWTP (East)	**PW368**	**13/03/2023**	**0089_PW368_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	902	<1	902	791	800	25,200
WWTP (East)	**PW369**	**14/03/2023**	**0089_PW369_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	204	<1	204	761	850	24,200
Dredge Spoil / Careening Bay	**PW374**	**14/03/2023**	**0089_PW374_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	638	670	20,400
Dredge Spoil / Careening Bay	**PW375**	**14/03/2023**	**0089_PW375_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	215	<1	215	506	521	16,100
Dredge Spoil / Careening Bay	**PW378**	**14/03/2023**	**0089_PW378_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	342	<1	342	239	231	7,320
WWTP (West)	**PW380**	**15/03/2023**	**0089_PW380_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	626	673	20,100
WWTP (West)	**PW381**	**15/03/2023**	**0089_PW381_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	697	659	22,600
WWTP (West)	**PW401**	**15/03/2023**	**0089_PW401_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	627	675	20,100
HSF	**PW405**	**14/03/2023**	**0089_PW405_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.67	0.75	<1	129	<1	129	614	664	19,600
HSF	**PW407**	**14/03/2023**	**0089_PW407_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	252	<1	252	550	546	17,200
HSF	**PW409**	**14/03/2023**	**0089_PW409_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	190	<1	190	727	760	23,300
HSF	**PW411**	**15/03/2023**	**0089_PW411_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	211	<1	211	639	681	20,500
HSF	**PW413**	**15/03/2023**	**0089_PW413_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	120	<1	120	632	675	20,200
HSF	**PW415**	**15/03/2023**	**0089_PW415_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	169	<1	169	614	679	19,600
FTA	**SW130**	**13/03/2023**	**0089_QC102_230313**	**Field Duplicate**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.05	0.05	<1	135	<1	135	631	677	20,200
FTA	**SW130**	**13/03/2023**	**0089_QC202_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1							
FTA	**SW130**	**13/03/2023**	**0089_SW130_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.03	0.03	<1	137	<1	137	628	676	20,100
FTA	**SW132**	**13/03/2023**	**0089_SW132_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.02	0.02	<1	129	<1	129	625	665	19,900
FTA	**SW134**	**13/03/2023**	**0089_SW134_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	625	672	20,000
Demolition Ground	**SW150**	**15/03/2023**	**0089_SW150_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	605	673	19,300
Demolition Ground	**SW152**	**15/03/2023**	**0089_SW152_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	608	653	19,400
Demolition Ground	**SW154**	**15/03/2023**	**0089_SW154_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	602	669	19,200
Demolition Ground	**SW156**	**15/03/2023**	**0089_SW156_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	621	680	19,900
WWTP (East)	**SW305**	**13/03/2023**	**0089_QC114_230313**	**Field Duplicate**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	127	<1	127	620	654	19,900
WWTP (East)	**SW305**	**13/03/2023**	**0089_QC214_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.01	<0.05	<0.1							
WWTP (East)	**SW305**	**13/03/2023**	**0089_SW305_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	126	<1	126	616	650	19,700
HSF	**SW309**	**14/03/2023**	**0089_SW309_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	627	654	20,100
HSF	**SW310**	**14/03/2023**	**0089_SW310_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	166	<1	166	623	660	19,900
HSF	**SW311**	**14/03/2023**	**0089_SW311_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	630	649	20,200
Dredge Spoil / Careening Bay	**SW317**	**14/03/2023**	**0089_SW317_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	615	652	19,700
Dredge Spoil / Careening Bay	**SW318**	**14/03/2023**	**0089_SW318_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	617	642	19,800

Table 1 - Water samples analytical results

						lomer Sulfonic Acids		PFAS - Perfluoroalkyl Sulfonamides							PFAS			Inorganics						
						8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L
LOR - Limit of Reporting						0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1	1	1	1	0.01	0.01	1
PFAS NEMP 2020 Drinking Water															*0.07*									
PFAS NEMP 2020 Interim Marine 99%																								
PFAS NEMP 2020 Recreational Water															**2**									
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																			
Dredge Spoil / Careening Bay	**SW319**	**14/03/2023**	**0089_SW319_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	620	637	19,900
WWTP (West)	**SW353**	**15/03/2023**	**0089_SW353_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	619	669	19,800
WWTP (East)	**SW370**	**14/03/2023**	**0089_SW370_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	145	<1	145	618	667	19,900
WWTP (East)	**SW371**	**13/03/2023**	**0089_SW371_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	124	<1	124	636	654	20,400
WWTP (East)	**SW372**	**14/03/2023**	**0089_SW372_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	124	<1	124	624	647	20,000
WWTP (West)	**SW373**	**14/03/2023**	**0089_QC116_230314**	**Field Duplicate**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.15*	0.15	0.15	<1	134	<1	134	609	659	19,500
WWTP (West)	**SW373**	**14/03/2023**	**0089_QC216_230314**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.16*	0.16	0.16							
WWTP (West)	**SW373**	**14/03/2023**	**0089_SW373_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.15*	0.15	0.15	<1	136	<1	136	617	675	19,800
WWTP (West)	**SW382**	**15/03/2023**	**0089_SW382_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	627	652	20,200
WWTP (West)	**SW383**	**15/03/2023**	**0089_SW383_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	630	669	20,300
WWTP (West)	**SW384**	**15/03/2023**	**0089_SW384_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	601	662	19,300
HSF	**SW406**	**14/03/2023**	**0089_SW406_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	127	<1	127	634	648	20,300
HSF	**SW408**	**14/03/2023**	**0089_SW408_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	609	670	19,500
HSF	**SW410**	**14/03/2023**	**0089_SW410_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	616	653	19,700
HSF	**SW412**	**15/03/2023**	**0089_SW412_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	626	663	20,100
HSF	**SW414**	**15/03/2023**	**0089_SW414_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	643	658	20,700
HSF	**SW416**	**15/03/2023**	**0089_SW416_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	621	668	19,900

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water

HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%

HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First-time detection of PFOA or PFHxS+PFOS

New exceedance of guideline value

								Metals			
						Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water											
PFAS NEMP 2020 Interim Marine 99%											
PFAS NEMP 2020 Recreational Water											
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**						
		13/03/2023	0089_QC301_230313	Rinsate	EP2303119						
		13/03/2023	0089_QC302_230313	Rinsate	EP2303119						
		13/03/2023	0089_QC303_230313	Rinsate	EP2303119						
		13/03/2023	0089_QC401_230313	Field Blank	EP2303119						
		13/03/2023	0089_QC402_230313	Field Blank	EP2303119						
		13/03/2023	0089_QC403_230313	Field Blank	EP2303119						
		14/03/2023	0089_QC301_230314	Rinsate	EP2303178						
		14/03/2023	0089_QC302_230314	Rinsate	EP2303178						
		14/03/2023	0089_QC401_230314	Field Blank	EP2303178						
		14/03/2023	0089_QC402_230314	Field Blank	EP2303178						
		15/03/2023	0089_QC301_230315	Rinsate	EP2303227						
		15/03/2023	0089_QC302_230315	Rinsate	EP2303227						
		15/03/2023	0089_QC303_230315	Rinsate	EP2303227						
		15/03/2023	0089_QC401_230315	Field Blank	EP2303227						
		15/03/2023	0089_QC402_230315	Field Blank	EP2303227						
		15/03/2023	0089_QC403_230315	Field Blank	EP2303227						
FTA	MW109	13/03/2023	0089_MW109_230313	Normal	EP2303119	7.75	25	101	41	<1	124
FTA	MW109	13/03/2023	0089_QC107_230313	Field Duplicate	EP2303119						
FTA	MW109	13/03/2023	0089_QC207_230313	Interlab Duplicate	972487						
FTA	MW112	13/03/2023	0089_MW112_230313	Normal	EP2303119	5.78	15	72	9	<1	20
FTA	MW120	13/03/2023	0089_MW120_230313	Normal	EP2303119	5.88	21	69	20	2	33
FTA	MW120	13/03/2023	0089_QC105_230313	Field Duplicate	EP2303119						
FTA	MW120	13/03/2023	0089_QC205_230313	Interlab Duplicate	972487						
FTA	MW121	13/03/2023	0089_MW121_230313	Normal	EP2303119	5.61	7	78	13	2	15
FTA	MW123	13/03/2023	0089_MW123_230313	Normal	EP2303119	5.80	19	113	67	3	252
FTA	MW123	13/03/2023	0089_QC101_230313	Field Duplicate	EP2303119	6.52	18	131	73	3	254
FTA	MW123	13/03/2023	0089_QC201_230313	Interlab Duplicate	972487						
FTA	MW124	13/03/2023	0089_MW124_230313	Normal	EP2303085	7.17	1,980	399	958	360	7,520
FTA	MW125	13/03/2023	0089_MW125_230313	Normal	EP2303085	8.16	2,050	404	990	367	7,680
FTA	MW126	13/03/2023	0089_MW126_230313	Normal	EP2303085	9.30	1,640	389	1,050	345	7,630
FTA	MW126	13/03/2023	0089_QC110_230313	Field Duplicate	EP2303085	7.97	1,670	363	963	323	7,020
FTA	MW126	13/03/2023	0089_QC210_230313	Interlab Duplicate	972487						
FTA	MW127	13/03/2023	0089_MW127_230313	Normal	EP2303085	7.54	1,750	352	940	322	6,810
Demolition Ground	MW139	15/03/2023	0089_MW139_230315	Normal	EP2303226	0.86	141	125	90	32	691
Demolition Ground	MW141	15/03/2023	0089_MW141_230315	Normal	EP2303226	3.71	836	394	612	174	4,840
Demolition Ground	MW142	15/03/2023	0089_MW142_230315	Normal	EP2303226	6.21	1,510	367	807	302	6,600
Demolition Ground	MW147	15/03/2023	0089_MW147_230315	Normal	EP2303226	2.27	1,210	336	699	238	5,620
Demolition Ground	MW149	15/03/2023	0089_MW149_230315	Normal	EP2303226	5.36	2,220	366	1,130	479	9,420
WWTP	MW158	13/03/2023	0089_MW158_230313	Normal	EP2303084	2.19	467	188	321	101	2,240
WWTP	MW161	13/03/2023	0089_MW161_230313	Normal	EP2303084	7.19	219	68	69	34	394
WWTP	MW166	13/03/2023	0089_MW166_230313	Normal	EP2303084	1.03	172	107	91	37	487
WWTP	MW171	13/03/2023	0089_MW171_230313	Normal	EP2303084	2.28	598	195	391	105	2,600
WWTP	MW171	13/03/2023	0089_QC103_230313	Field Duplicate	EP2303084	3.73	596	191	387	104	2,580
WWTP	MW171	13/03/2023	0089_QC203_230313	Interlab Duplicate	972487						
WWTP	MW172	13/03/2023	0089_MW172_230313	Normal	EP2303084	2.10	251	98	130	51	769
WWTP	MW173	13/03/2023	0089_MW173_230313	Normal	EP2303084	3.83	122	125	89	24	454
WWTP	MW193	13/03/2023	0089_MW193_230313	Normal	EP2303084	9.50	172	92	98	22	390
WWTP	MW195D	13/03/2023	0089_MW195D_230313	Normal	EP2303084	5.65	1,220	302	538	189	4,020
WWTP	MW195S	13/03/2023	0089_MW195S_230313	Normal	EP2303084	5.63	266	149	113	35	465
WWTP	MW195S	13/03/2023	0089_QC113_230313	Field Duplicate	EP2303084	8.15	273	150	115	36	485
WWTP	MW195S	13/03/2023	0089_QC213_230313	Interlab Duplicate	972487						
WWTP	MW196	13/03/2023	0089_MW196_230313	Normal	EP2303119	2.18	20	59	19	2	23
WWTP	MW197	14/03/2023	0089_MW197_230314	Normal	EP2303177	2.73	107	54	110	26	410
WWTP	MW199	13/03/2023	0089_MW199_230313	Normal	EP2303084	3.24	262	108	161	77	1,620
WWTP	MW199	13/03/2023	0089_QC111_230313	Field Duplicate	EP2303084	5.71	317	110	171	81	1,680
WWTP	MW199	13/03/2023	0089_QC211_230313	Interlab Duplicate	972487						
WWTP	MW200	14/03/2023	0089_MW200_230314	Normal	EP2303177	1.31	200	84	98	62	1,270
WWTP	MW202	13/03/2023	0089_MW202_230313	Normal	EP2303085	8.76	67	80	25	7	129
WWTP	MW203	13/03/2023	0089_MW203_230313	Normal	EP2303085	2.47	172	48	58	13	104
HSF	MW214	14/03/2023	0089_MW214_230314	Normal	EP2303177	2.52	52	262	152	7	1,130
HSF	MW215	14/03/2023	0089_MW215_230314	Normal	EP2303177	5.70	88	129	35	8	174
HSF	MW216	14/03/2023	0089_MW216_230314	Normal	EP2303177	0.79	212	206	70	10	492
HSF	MW217	15/03/2023	0089_MW217_230315	Normal	EP2303198	3.27	70	114	15	12	40
HSF	MW220	15/03/2023	0089_MW220_230315	Normal	EP2303198	3.57	29	80	15	8	38
HSF	MW224	15/03/2023	0089_MW224_230315	Normal	EP2303198	8.39	56	48	20	4	89
HSF	MW225	14/03/2023	0089_MW225_230314	Normal	EP2303177	8.88	62	111	42	5	218
HSF	MW226	14/03/2023	0089_MW226_230314	Normal	EP2303178	4.26	2,180	376	908	387	7,050
HSF	MW227	14/03/2023	0089_MW227_230314	Normal	EP2303178	4.87	240	99	65	25	444
HSF	MW228	14/03/2023	0089_MW228_230314	Normal	EP2303178	0.10	745	142	356	126	2,660
AVCAT Storage and Fuel Farm	MW233	13/03/2023	0089_MW233_230313	Normal	EP2303119	1.20	5	45	6	2	12
AVCAT Storage and Fuel Farm	MW238	15/03/2023	0089_MW238_230315	Normal	EP2303198	1.44	68	86	16	5	28
AVCAT Storage and Fuel Farm	MW239	15/03/2023	0089_MW239_230315	Normal	EP2303198	9.29	36	85	12	3	31
AVCAT Storage and Fuel Farm	MW240	15/03/2023	0089_MW240_230315	Normal	EP2303198	2.54	53	99	11	4	36
AVCAT Storage and Fuel Farm	MW242	15/03/2023	0089_MW242_230315	Normal	EP2303198	8.60	25	52	10	1	10
AVCAT Storage and Fuel Farm	MW243	15/03/2023	0089_MW243_230315	Normal	EP2303198	2.83	81	111	17	5	42
AVCAT Storage and Fuel Farm	MW245	15/03/2023	0089_MW245_230315	Normal	EP2303198	8.92	<1	71	8	2	19

Table 1 - Water samples analytical results

								Metals			
						Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water											
PFAS NEMP 2020 Interim Marine 99%											
PFAS NEMP 2020 Recreational Water											
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**						
AVCAT Storage and Fuel Farm	**MW249**	**13/03/2023**	**0089_MW249_230313**	**Normal**	**EP2303119**	7.39	68	88	41	8	102
Fire Station, Flammable/Hazardous	**MW255**	**13/03/2023**	**0089_MW255_230313**	**Normal**	**EP2303119**	4.78	51	85	13	4	46
Fire Station, Flammable/Hazardous	**MW256**	**13/03/2023**	**0089_MW256_230313**	**Normal**	**EP2303119**	8.58	61	102	49	3	172
Fire Station, Flammable/Hazardous	**MW257**	**13/03/2023**	**0089_MW257_230313**	**Normal**	**EP2303119**	3.68	17	70	10	4	23
Fire Station, Flammable/Hazardous	**MW258**	**13/03/2023**	**0089_MW258_230313**	**Normal**	**EP2303119**	5.33	100	123	32	19	85
Fire Station, Flammable/Hazardous	**MW259**	**13/03/2023**	**0089_MW259_230313**	**Normal**	**EP2303119**	6.80	10	67	9	<1	12
Dredge Spoil / Careening Bay	**MW268**	**15/03/2023**	**0089_MW268_230315**	**Normal**	**EP2303198**	2.81	694	174	214	55	1,060
Dredge Spoil / Careening Bay	**MW269**	**15/03/2023**	**0089_MW269_230315**	**Normal**	**EP2303198**	6.82	122	74	56	12	164
HSF	**MW282**	**15/03/2023**	**0089_MW282_230315**	**Normal**	**EP2303198**	0.17	24	172	26	2	36
Accomodation Area	**MW288**	**14/03/2023**	**0089_MW288_230314**	**Normal**	**EP2303178**	8.11	28	85	20	4	37
Accomodation Area	**MW289**	**14/03/2023**	**0089_MW289_230314**	**Normal**	**EP2303178**	6.06	102	97	31	5	104
AVCAT Storage and Fuel Farm	**MW496**	**13/03/2023**	**0089_MW496_230313**	**Normal**	**EP2303119**	8.94	94	60	33	14	187
FTA	**MW500**	**13/03/2023**	**0089_MW500_230313**	**Normal**	**EP2303119**	9.07	51	128	16	2	25
AVCAT Storage and Fuel Farm	**MW516**	**13/03/2023**	**0089_MW516_230313**	**Normal**	**EP2303119**	6.83	19	88	35	8	53
WWTP (East)	**PW304**	**13/03/2023**	**0089_PW304_230313**	**Normal**	**EP2303086**	3.83	2,970	493	1,530	598	12,500
WWTP (East)	**PW304**	**13/03/2023**	**0089_QC115_230313**	**Field Duplicate**	**EP2303086**	2.35	2,990	489	1,520	595	12,400
WWTP (East)	**PW304**	**13/03/2023**	**0089_QC215_230313**	**Interlab Duplicate**	**972487**						
HSF	**PW306**	**14/03/2023**	**0089_PW306_230314**	**Normal**	**EP2303175**	4.63	2,820	472	1,480	570	11,900
HSF	**PW307**	**14/03/2023**	**0089_PW307_230314**	**Normal**	**EP2303175**	4.51	2,780	469	1,500	574	12,000
HSF	**PW308**	**14/03/2023**	**0089_PW308_230314**	**Normal**	**EP2303175**	4.78	2,710	470	1,490	575	12,000
HSF	**PW314**	**14/03/2023**	**0089_PW314_230314**	**Normal**	**EP2303175**	3.78	2,870	482	1,470	579	11,800
HSF	**PW315**	**14/03/2023**	**0089_PW315_230314**	**Normal**	**EP2303175**	1.23	2,820	453	1,420	548	11,500
HSF	**PW316**	**14/03/2023**	**0089_PW316_230314**	**Normal**	**EP2303175**	3.54	2,780	465	1,490	572	12,000
Demolition Ground	**PW329**	**15/03/2023**	**0089_PW329_230315**	**Normal**	**EP2303227**	4.66	2,850	462	1,460	556	11,900
Demolition Ground	**PW330**	**15/03/2023**	**0089_PW330_230315**	**Normal**	**EP2303227**	6.65	2,820	463	1,460	547	12,000
Demolition Ground	**PW331**	**15/03/2023**	**0089_PW331_230315**	**Normal**	**EP2303227**	2.25	2,810	497	1,530	568	12,000
FTA	**PW335**	**13/03/2023**	**0089_PW335_230313**	**Normal**	**EP2303086**	4.88	3,240	542	1,740	672	14,000
FTA	**PW340**	**13/03/2023**	**0089_PW340_230313**	**Normal**	**EP2303086**	2.48	3,280	532	1,680	652	13,400
FTA	**PW341**	**13/03/2023**	**0089_PW341_230313**	**Normal**	**EP2303086**	3.07	2,910	470	1,480	579	12,000
WWTP (East)	**PW345**	**14/03/2023**	**0089_PW345_230314**	**Normal**	**EP2303175**	4.61	3,220	528	1,670	645	13,500
Accomodation Area	**PW346**	**14/03/2023**	**0089_PW346_230314**	**Normal**	**EP2303179**	3.75	2,730	555	1,590	614	12,700
Accomodation Area	**PW346**	**14/03/2023**	**0089_QC118_230314**	**Field Duplicate**	**EP2303179**	3.32	2,790	556	1,600	613	12,700
Accomodation Area	**PW346**	**14/03/2023**	**0089_QC218_230314**	**Interlab Duplicate**	**972487**						
WWTP (West)	**PW350**	**15/03/2023**	**0089_PW350_230315**	**Normal**	**EP2303229**	1.65	3,490	450	1,440	542	11,700
WWTP (West)	**PW351**	**15/03/2023**	**0089_PW351_230315**	**Normal**	**EP2303229**	1.87	2,750	451	1,440	540	11,800
WWTP (West)	**PW352**	**15/03/2023**	**0089_PW352_230315**	**Normal**	**EP2303229**	2.99	2,800	459	1,470	556	12,100
Demolition Ground	**PW356**	**15/03/2023**	**0089_PW356_230315**	**Normal**	**EP2303227**	4.75	2,780	485	1,480	550	11,700
Demolition Ground	**PW357**	**15/03/2023**	**0089_PW357_230315**	**Normal**	**EP2303227**	4.01	2,840	457	1,430	537	11,700
FTA	**PW358**	**15/03/2023**	**0089_PW358_230315**	**Normal**	**EP2303227**	5.70	2,760	452	1,440	541	11,800
FTA	**PW362**	**13/03/2023**	**0089_PW362_230313**	**Normal**	**EP2303086**	2.49	3,430	545	1,740	676	14,000
FTA	**PW362**	**13/03/2023**	**0089_QC109_230313**	**Field Duplicate**	**EP2303086**	4.22	3,250	532	1,700	654	13,600
FTA	**PW362**	**13/03/2023**	**0089_QC209_230313**	**Interlab Duplicate**	**972487**						
FTA	**PW363**	**13/03/2023**	**0089_PW363_230313**	**Normal**	**EP2303086**	4.36	3,250	542	1,710	670	13,800
FTA	**PW364**	**13/03/2023**	**0089_PW364_230313**	**Normal**	**EP2303086**	4.26	3,280	531	1,720	721	13,900
FTA	**PW364**	**13/03/2023**	**0089_QC106_230313**	**Field Duplicate**	**EP2303086**	3.28	3,280	518	1,670	702	13,600
FTA	**PW364**	**13/03/2023**	**0089_QC206_230313**	**Interlab Duplicate**	**972487**						
WWTP (East)	**PW367**	**14/03/2023**	**0089_PW367_230314**	**Normal**	**EP2303175**	0.20	2,870	456	1,490	574	12,000
WWTP (East)	**PW368**	**13/03/2023**	**0089_PW368_230313**	**Normal**	**EP2303086**	0.54	2,980	615	1,730	684	14,000
WWTP (East)	**PW369**	**14/03/2023**	**0089_PW369_230314**	**Normal**	**EP2303175**	5.52	3,550	586	1,870	714	14,900
Dredge Spoil / Careening Bay	**PW374**	**14/03/2023**	**0089_PW374_230314**	**Normal**	**EP2303179**	2.50	2,870	453	1,460	565	11,800
Dredge Spoil / Careening Bay	**PW375**	**14/03/2023**	**0089_PW375_230314**	**Normal**	**EP2303179**	1.49	2,290	351	1,140	438	9,170
Dredge Spoil / Careening Bay	**PW378**	**14/03/2023**	**0089_PW378_230314**	**Normal**	**EP2303179**	1.79	1,250	186	543	201	3,950
WWTP (West)	**PW380**	**15/03/2023**	**0089_PW380_230315**	**Normal**	**EP2303229**	3.67	2,700	453	1,450	544	11,900
WWTP (West)	**PW381**	**15/03/2023**	**0089_PW381_230315**	**Normal**	**EP2303229**	2.80	2,750	449	1,440	539	11,600
WWTP (West)	**PW401**	**15/03/2023**	**0089_PW401_230315**	**Normal**	**EP2303229**	3.64	2,780	460	1,460	548	11,900
HSF	**PW405**	**14/03/2023**	**0089_PW405_230314**	**Normal**	**EP2303179**	3.93	2,800	450	1,440	552	11,700
HSF	**PW407**	**14/03/2023**	**0089_PW407_230314**	**Normal**	**EP2303179**	0.35	2,850	381	1,200	456	9,570
HSF	**PW409**	**14/03/2023**	**0089_PW409_230314**	**Normal**	**EP2303179**	2.26	3,160	505	1,650	650	13,400
HSF	**PW411**	**15/03/2023**	**0089_PW411_230315**	**Normal**	**EP2303229**	3.17	2,720	477	1,470	554	12,000
HSF	**PW413**	**15/03/2023**	**0089_PW413_230315**	**Normal**	**EP2303229**	3.29	2,880	451	1,470	549	11,900
HSF	**PW415**	**15/03/2023**	**0089_PW415_230315**	**Normal**	**EP2303229**	5.04	2,760	455	1,460	551	12,000
FTA	**SW130**	**13/03/2023**	**0089_QC102_230313**	**Field Duplicate**	**EP2303086**	3.50	2,830	466	1,480	572	11,900
FTA	**SW130**	**13/03/2023**	**0089_QC202_230313**	**Interlab Duplicate**	**972487**						
FTA	**SW130**	**13/03/2023**	**0089_SW130_230313**	**Normal**	**EP2303086**	3.71	2,800	466	1,470	569	11,900
FTA	**SW132**	**13/03/2023**	**0089_SW132_230313**	**Normal**	**EP2303086**	3.14	2,930	458	1,450	560	11,700
FTA	**SW134**	**13/03/2023**	**0089_SW134_230313**	**Normal**	**EP2303086**	3.60	2,810	463	1,470	566	11,800
Demolition Ground	**SW150**	**15/03/2023**	**0089_SW150_230315**	**Normal**	**EP2303227**	5.37	2,780	471	1,490	549	11,800
Demolition Ground	**SW152**	**15/03/2023**	**0089_SW152_230315**	**Normal**	**EP2303227**	3.51	2,820	443	1,420	531	11,500
Demolition Ground	**SW154**	**15/03/2023**	**0089_SW154_230315**	**Normal**	**EP2303227**	5.32	2,770	456	1,450	550	11,800
Demolition Ground	**SW156**	**15/03/2023**	**0089_SW156_230315**	**Normal**	**EP2303227**	4.50	2,760	458	1,470	550	12,000
WWTP (East)	**SW305**	**13/03/2023**	**0089_QC114_230313**	**Field Duplicate**	**EP2303086**	2.67	2,710	450	1,430	548	11,500
WWTP (East)	**SW305**	**13/03/2023**	**0089_QC214_230313**	**Interlab Duplicate**	**972487**						
WWTP (East)	**SW305**	**13/03/2023**	**0089_SW305_230313**	**Normal**	**EP2303086**	2.70	2,760	447	1,430	549	11,400
HSF	**SW309**	**14/03/2023**	**0089_SW309_230314**	**Normal**	**EP2303175**	2.14	2,750	446	1,430	545	11,500
HSF	**SW310**	**14/03/2023**	**0089_SW310_230314**	**Normal**	**EP2303175**	2.86	2,810	452	1,440	557	11,600
HSF	**SW311**	**14/03/2023**	**0089_SW311_230314**	**Normal**	**EP2303175**	1.45	2,780	442	1,420	542	11,400
Dredge Spoil / Careening Bay	**SW317**	**14/03/2023**	**0089_SW317_230314**	**Normal**	**EP2303179**	2.86	2,750	436	1,410	538	11,500
Dredge Spoil / Careening Bay	**SW318**	**14/03/2023**	**0089_SW318_230314**	**Normal**	**EP2303179**	1.94	2,710	431	1,400	534	11,300

Table 1 - Water samples analytical results

							Metals					
							Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
							%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting							0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water												
PFAS NEMP 2020 Interim Marine 99%												
PFAS NEMP 2020 Recreational Water												
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**							
Dredge Spoil / Careening Bay	**SW319**	**14/03/2023**	**0089_SW319_230314**	**Normal**	**EP2303179**		1.36	2,710	429	1,400	533	11,200
WWTP (West)	**SW353**	**15/03/2023**	**0089_SW353_230315**	**Normal**	**EP2303229**		3.84	2,800	446	1,450	544	11,800
WWTP (East)	**SW370**	**14/03/2023**	**0089_SW370_230314**	**Normal**	**EP2303175**		3.74	2,610	468	1,460	556	11,700
WWTP (East)	**SW371**	**13/03/2023**	**0089_SW371_230313**	**Normal**	**EP2303086**		1.33	2,810	449	1,420	550	11,500
WWTP (East)	**SW372**	**14/03/2023**	**0089_SW372_230314**	**Normal**	**EP2303179**		1.86	2,740	435	1,410	538	11,400
WWTP (West)	**SW373**	**14/03/2023**	**0089_QC116_230314**	**Field Duplicate**	**EP2303179**		3.94	2,690	450	1,430	546	11,600
WWTP (West)	**SW373**	**14/03/2023**	**0089_QC216_230314**	**Interlab Duplicate**	**972487**							
WWTP (West)	**SW373**	**14/03/2023**	**0089_SW373_230314**	**Normal**	**EP2303179**		4.48	2,690	461	1,460	565	11,900
WWTP (West)	**SW382**	**15/03/2023**	**0089_SW382_230315**	**Normal**	**EP2303229**		1.90	2,650	441	1,410	527	11,500
WWTP (West)	**SW383**	**15/03/2023**	**0089_SW383_230315**	**Normal**	**EP2303229**		2.96	2,660	451	1,450	542	11,800
WWTP (West)	**SW384**	**15/03/2023**	**0089_SW384_230315**	**Normal**	**EP2303229**		4.86	2,600	444	1,430	531	11,700
HSF	**SW406**	**14/03/2023**	**0089_SW406_230314**	**Normal**	**EP2303179**		1.12	2,820	435	1,420	542	11,400
HSF	**SW408**	**14/03/2023**	**0089_SW408_230314**	**Normal**	**EP2303179**		4.77	2,720	456	1,460	555	11,800
HSF	**SW410**	**14/03/2023**	**0089_SW410_230314**	**Normal**	**EP2303179**		2.88	2,800	440	1,420	544	11,500
HSF	**SW412**	**15/03/2023**	**0089_SW412_230315**	**Normal**	**EP2303229**		2.82	2,740	450	1,430	537	11,700
HSF	**SW414**	**15/03/2023**	**0089_SW414_230315**	**Normal**	**EP2303229**		1.18	2,730	452	1,430	538	11,600
HSF	**SW416**	**15/03/2023**	**0089_SW416_230315**	**Normal**	**EP2303229**		3.63	2,750	448	1,440	537	11,800

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First-time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids					
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting							0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0002	0.0005
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
WWTP	**SD304**	**13/03/2023**	**0089_SD304_230313**	**Normal**	**EP2303087**		<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
HSF	**SD306**	**14/03/2023**	**0089_SD306_230314**	**Normal**	**EP2303176**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
HSF	**SD307**	**14/03/2023**	**0089_SD307_230314**	**Normal**	**EP2303176**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
HSF	**SD308**	**14/03/2023**	**0089_SD308_230314**	**Normal**	**EP2303176**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
HSF	**SD314**	**14/03/2023**	**0089_SD314_230314**	**Normal**	**EP2303176**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
HSF	**SD315**	**14/03/2023**	**0089_SD315_230314**	**Normal**	**EP2303176**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
HSF	**SD316**	**14/03/2023**	**0089_SD316_230314**	**Normal**	**EP2303176**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
Demolition ground	**SD329**	**15/03/2023**	**0089_SD329_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
Demolition ground	**SD330**	**15/03/2023**	**0089_SD330_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
Demolition ground	**SD331**	**15/03/2023**	**0089_SD331_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
FTA	**SD335**	**13/03/2023**	**0089_SD335_230313**	**Normal**	**EP2303087**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
FTA	**SD340**	**13/03/2023**	**0089_SD340_230313**	**Normal**	**EP2303087**		<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
FTA	**SD341**	**13/03/2023**	**0089_SD341_230313**	**Normal**	**EP2303087**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
WWTP	**SD345**	**14/03/2023**	**0089_SD345_230314**	**Normal**	**EP2303176**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
Accomodation Area	**SD346**	**14/03/2023**	**0089_SD346_230314**	**Normal**	**EP2303180**		<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
WWTP	**SD350**	**15/03/2023**	**0089_SD350_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
WWTP	**SD351**	**15/03/2023**	**0089_SD351_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
WWTP	**SD352**	**15/03/2023**	**0089_SD352_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
Demolition ground	**SD356**	**15/03/2023**	**0089_SD356_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
Demolition ground	**SD357**	**15/03/2023**	**0089_SD357_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
Demolition ground	**SD358**	**15/03/2023**	**0089_SD358_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
FTA	**SD362**	**13/03/2023**	**0089_SD362_230313**	**Normal**	**EP2303087**		<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
FTA	**SD363**	**13/03/2023**	**0089_SD363_230313**	**Normal**	**EP2303087**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
FTA	**SD364**	**13/03/2023**	**0089_SD364_230313**	**Normal**	**EP2303087**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
WWTP	**SD367**	**14/03/2023**	**0089_SD367_230314**	**Normal**	**EP2303176**		<0.0002	<0.0002	<0.0002	<0.0002	0.0007	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
WWTP	**SD368**	**13/03/2023**	**0089_SD368_230313**	**Normal**	**EP2303087**		<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
WWTP	**SD369**	**14/03/2023**	**0089_SD369_230314**	**Normal**	**EP2303176**		<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
Dredge spoil and careening bay	**SD374**	**14/03/2023**	**0089_SD374_230314**	**Normal**	**EP2303180**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
Dredge spoil and careening bay	**SD375**	**14/03/2023**	**0089_SD375_230314**	**Normal**	**EP2303180**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
Dredge spoil and careening bay	**SD378**	**14/03/2023**	**0089_SD378_230314**	**Normal**	**EP2303180**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
WWTP	**SD380**	**15/03/2023**	**0089_SD380_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
WWTP	**SD381**	**15/03/2023**	**0089_SD381_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
WWTP	**SD401**	**15/03/2023**	**0089_SD401_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
HSF	**SD405**	**14/03/2023**	**0089_SD405_230314**	**Normal**	**EP2303180**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
HSF	**SD407**	**14/03/2023**	**0089_SD407_230314**	**Normal**	**EP2303180**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
HSF	**SD409**	**14/03/2023**	**0089_SD409_230314**	**Normal**	**EP2303180**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
HSF	**SD411**	**15/03/2023**	**0089_SD411_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
HSF	**SD413**	**15/03/2023**	**0089_SD413_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005
HSF	**SD415**	**15/03/2023**	**0089_SD415_230315**	**Normal**	**EP2303228**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005

Notes:
First-time detection of PFOA or PFHxS+PFOS

						PFAS - Perfluoroalkyl Sulfonamides					PFAS		
						N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**								
WWTP	SD304	13/03/2023	0089_SD304_230313	Normal	EP2303087	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
HSF	SD306	14/03/2023	0089_SD306_230314	Normal	EP2303176	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	14/03/2023	0089_SD307_230314	Normal	EP2303176	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	14/03/2023	0089_SD308_230314	Normal	EP2303176	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	14/03/2023	0089_SD314_230314	Normal	EP2303176	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	14/03/2023	0089_SD315_230314	Normal	EP2303176	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	14/03/2023	0089_SD316_230314	Normal	EP2303176	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	SD329	15/03/2023	0089_SD329_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	SD330	15/03/2023	0089_SD330_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	SD331	15/03/2023	0089_SD331_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	13/03/2023	0089_SD335_230313	Normal	EP2303087	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	13/03/2023	0089_SD340_230313	Normal	EP2303087	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
FTA	SD341	13/03/2023	0089_SD341_230313	Normal	EP2303087	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD345	14/03/2023	0089_SD345_230314	Normal	EP2303176	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Accomodation Area	SD346	14/03/2023	0089_SD346_230314	Normal	EP2303180	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	SD350	15/03/2023	0089_SD350_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD351	15/03/2023	0089_SD351_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD352	15/03/2023	0089_SD352_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	SD356	15/03/2023	0089_SD356_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	SD357	15/03/2023	0089_SD357_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	SD358	15/03/2023	0089_SD358_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD362	13/03/2023	0089_SD362_230313	Normal	EP2303087	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
FTA	SD363	13/03/2023	0089_SD363_230313	Normal	EP2303087	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	13/03/2023	0089_SD364_230313	Normal	EP2303087	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD367	14/03/2023	0089_SD367_230314	Normal	EP2303176	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0007	0.0007	0.0007
WWTP	SD368	13/03/2023	0089_SD368_230313	Normal	EP2303087	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	SD369	14/03/2023	0089_SD369_230314	Normal	EP2303176	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil and careening bay	SD374	14/03/2023	0089_SD374_230314	Normal	EP2303180	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and careening bay	SD375	14/03/2023	0089_SD375_230314	Normal	EP2303180	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and careening bay	SD378	14/03/2023	0089_SD378_230314	Normal	EP2303180	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD380	15/03/2023	0089_SD380_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	15/03/2023	0089_SD381_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD401	15/03/2023	0089_SD401_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	14/03/2023	0089_SD405_230314	Normal	EP2303180	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	14/03/2023	0089_SD407_230314	Normal	EP2303180	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	14/03/2023	0089_SD409_230314	Normal	EP2303180	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	15/03/2023	0089_SD411_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	15/03/2023	0089_SD413_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	15/03/2023	0089_SD415_230315	Normal	EP2303228	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Notes:
First-time detection of PFOA or PFHxS+PFOS

Date			13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023
Field ID			0089_SW130_230313	0089_QC102_230313		0089_SW130_230313	0089_QC202_230313		0089_MW123_230313	0089_QC101_230313		0089_MW123_230313	0089_QC201_230313		0089_MW171_230313	0089_QC103_230313
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water		Water	Water
Lab Report Number			EP2303086	EP2303086	RPD	EP2303086	972487	RPD	EP2303119	EP2303119	RPD	EP2303119	972487	RPD	EP2303084	EP2303084
	Unit	LOR														
PFAS - Perfluoroalkyl Sulfonic Acids																
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01					<0.01						0.08			
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.31	0.31	0	0.31	0.33	6	0.10	0.03
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.28	0.28	0	0.28	0.33	16	0.04	<0.02
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	2.24	1.85	19	2.24	2.1	6	0.20	0.07
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.01	0.02	67	0.01	<0.01	0	0.03	0.03	0	0.03	0.03	0	0.02	<0.01
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01			
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
PFAS - Perfluoroalkyl Carboxylic Acids																
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	0.06	0	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.05	0.05	0	0.05	0.05	0	0.04	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.31	0.26	18	0.31	0.28	10	0.12	0.04
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	0.02	0.03	40	0.02	<0.01	67	0.03	0.02	40	0.03	0.02	40	0.03	<0.02
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05
PFAS - (n:2) Fluorotelomer Sulfonic Acids																
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05
PFAS - Perfluoroalkyl Sulfonamides																
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
PFAS																
Sum of PFHxS and PFOS	µg/L	0.01	0.01	0.02	67	0.01	<0.01	0	2.27	1.88	19	2.27	2.13	6	0.22	0.07
Sum of PFAS (WA DER List)	µg/L	0.01	0.03	0.05	50	0.03	<0.05	0	2.97	2.52	16	2.97	2.87	3	0.51	0.14
Sum of PFAS	µg/L	0.01	0.03	0.05	50	0.03	<0.1	0	3.25	2.80	15	3.25	3.28	1	0.55	0.14
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	0.01					<0.01						2.13			
Sum of PFAS (PFOS + PFOA)	µg/L	0.01					<0.01						0.03			

*RPDs have only been considered where a concentration is greater than 1 times the LOR.
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

		Date		13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023
		Field ID		0089_MW171_230313	0089_QC203_230313		0089_PW364_230313	0089_QC106_230313		0089_PW364_230313	0089_QC206_230313		0089_MW120_230313	0089_QC105_230313		0089_MW120_230313	0089_QC205_230313
		Matrix Type		Water	Water		Water	Water		Water	Water		Water	Water		Water	Water
		Lab Report Number	RPD	EP2303084	972487	RPD	EP2303086	EP2303086	RPD	EP2303086	972487	RPD	EP2303119	EP2303119	RPD	EP2303119	972487
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01			0.02						<0.01						<0.01
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	108	0.10	0.02	133	<0.02	<0.02	0	<0.02	<0.01	0	0.02	<0.02	0	0.02	0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	67	0.04	<0.01	120	<0.02	<0.02	0	<0.02	<0.01	0	0.03	0.02	40	0.03	0.04
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	**96**	0.20	0.05	**120**	<0.01	<0.01	0	<0.01	<0.01	0	4.24	4.71	11	4.24	5.2
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	3.26	1.38	**81**	3.26	1.1
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	67	0.02	<0.01	67	0.01	0.02	67	0.01	0.01	0	0.55	0.78	**35**	0.55	0.99
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01			<0.01						<0.01						<0.01
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	67	0.04	0.01	120	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	100	0.12	0.03	120	<0.02	<0.02	0	<0.02	<0.01	0	0.10	0.10	0	0.10	0.09
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	40	0.03	<0.01	100	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	0.01
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	1.47	0.69	**72**	1.47	0.98
Perfluorononanoic acid (PFNA)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluorodecanoic acid (PFDA)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	**103**	0.22	0.05	**126**	0.01	0.02	67	0.01	0.01	0	4.79	5.49	14	4.79	6.19
Sum of PFAS (WA DER List)	µg/L	0.01	**114**	0.51	0.11	**129**	0.01	0.02	67	0.01	<0.05	0	6.38	6.28	2	6.38	7.31
Sum of PFAS	µg/L	0.01	**119**	0.55	0.13	**124**	0.01	0.02	67	0.01	<0.1	0	9.67	7.68	**23**	9.67	8.45
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	0.01			0.05						0.01						7.17
Sum of PFAS (PFOS + PFOA)	µg/L	0.01			<0.01						0.01						1.97

		Date		13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023
		Field ID		0089_MW109_230313	0089_QC107_230313		0089_MW109_230313	0089_QC207_230313		0089_PW362_230313	0089_QC109_230313		0089_PW362_230313	0089_QC209_230313		0089_MW126_230313	0089_QC110_230313
		Matrix Type		Water	Water		Water	Water		Water	Water		Water	Water		Water	Water
		Lab Report Number	RPD	EP2303119	EP2303119	RPD	EP2303119	972487	RPD	EP2303086	EP2303086	RPD	EP2303086	972487	RPD	EP2303085	EP2303085
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01						0.02						<0.01			
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0	0.14	0.14	0	0.14	0.13	7	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	29	0.22	0.20	10	0.22	0.24	9	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	20	1.66	1.34	**21**	1.66	1.3	**24**	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	**99**	0.04	0.04	0	0.04	0.03	29	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	**57**	0.44	0.42	5	0.44	0.44	0	0.03	0.03	0	0.03	0.02	40	<0.01	<0.01
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01						<0.01						<0.01			
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	0	0.1	0.1	0	0.1	0.13	26	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0	0.03	0.02	40	0.03	0.03	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	11	0.27	0.24	12	0.27	0.21	**25**	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	0	0.02	<0.02	0	0.02	0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	µg/L	0.01	**40**	0.04	0.04	0	0.04	0.03	29	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01
Perfluorononanoic acid (PFNA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	**26**	2.10	1.76	18	2.10	1.74	19	0.03	0.03	0	0.03	0.02	40	<0.01	<0.01
Sum of PFAS (WA DER List)	µg/L	0.01	14	2.70	2.30	16	2.70	2.29	16	0.03	0.03	0	0.03	<0.05	0	<0.01	<0.01
Sum of PFAS	µg/L	0.01	13	2.96	2.54	15	2.96	2.58	14	0.03	0.03	0	0.03	<0.1	0	<0.01	<0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	0.01						1.77						0.02			
Sum of PFAS (PFOS + PFOA)	µg/L	0.01						0.47						0.02			

		Date		13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023
		Field ID		0089_MW126_230313	0089_QC210_230313		0089_MW199_230313	0089_QC111_230313		0089_MW199_230313	0089_QC211_230313		0089_MW195S_230313	0089_QC113_230313		0089_MW195S_230313	0089_QC213_230313
		Matrix Type		Water	Water		Water	Water		Water	Water		Water	Water		Water	Water
		Lab Report Number	RPD	EP2303085	972487	RPD	EP2303084	EP2303084	RPD	EP2303084	972487	RPD	EP2303084	EP2303084	RPD	EP2303084	972487
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01			<0.01						<0.01						<0.01
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01			<0.01						<0.01						<0.01
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01
Perfluorononanoic acid (PFNA)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluorodecanoic acid (PFDA)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01
Sum of PFAS (WA DER List)	µg/L	0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05
Sum of PFAS	µg/L	0.01	0	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	0.01			<0.01						<0.01						<0.01
Sum of PFAS (PFOS + PFOA)	µg/L	0.01			<0.01						<0.01						<0.01

Date				13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023		14/03/2023	14/03/2023	
Field ID				0089_SW305_230313	0089_QC114_230313		0089_SW305_230313	0089_QC214_230313		0089_PW304_230313	0089_QC115_230313		0089_PW304_230313	0089_QC215_230313		0089_SW373_230314	0089_QC116_230314	
Matrix Type				Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			RPD	EP2303086	EP2303086	RPD	EP2303086	972487	RPD	EP2303086	EP2303086	RPD	EP2303086	972487	RPD	EP2303179	EP2303179	RPD
	Unit	LOR																
PFAS - Perfluoroalkyl Sulfonic Acids																		
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01						<0.01						<0.01				
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	0.01	0.01	0	0.01	0.01	0	0.02	0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0	0.01	0.01	0	0.01	0.01	0	0.05	0.06	18	0.05	0.07	33	0.13	0.13	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01						<0.01						<0.01				
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																		
Perfluorobutanoic acid (PFBA)	µg/L	0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																		
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																		
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																		
Sum of PFHxS and PFOS	µg/L	0.01	0	0.01	0.01	0	0.01	0.01	0	0.06	0.07	15	0.06	0.08	29	0.15	0.15	0
Sum of PFAS (WA DER List)	µg/L	0.01	0	0.01	0.01	0	0.01	<0.05	0	0.06	0.07	15	0.06	0.08	29	0.15	0.15	0
Sum of PFAS	µg/L	0.01	0	0.01	0.01	0	0.01	<0.1	0	0.06	0.07	15	0.06	<0.1	0	0.15	0.15	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	0.01						0.01						0.08				
Sum of PFAS (PFOS + PFOA)	µg/L	0.01						0.01						0.07				

	Date		14/03/2023	14/03/2023		14/03/2023	14/03/2023		14/03/2023	14/03/2023	
	Field ID		0089_SW373_230314	0089_QC216_230314		0089_PW346_230314	0089_QC118_230314		0089_PW346_230314	0089_QC218_230314	
	Matrix Type		Water	Water		Water	Water		Water	Water	
	Lab Report Number		EP2303179	972487	RPD	EP2303179	EP2303179	RPD	EP2303179	972487	RPD
	Unit	LOR									
PFAS - Perfluoroalkyl Sulfonic Acids											
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01		<0.01						<0.01	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.02	0.02	0	0.01	0.02	67	0.01	0.02	67
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.13	0.14	7	0.22	0.41	**60**	0.22	0.28	**24**
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01		<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids											
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids											
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides											
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS											
Sum of PFHxS and PFOS	µg/L	0.01	0.15	0.16	6	0.23	0.43	**61**	0.23	0.3	**26**
Sum of PFAS (WA DER List)	µg/L	0.01	0.15	0.16	6	0.23	0.43	**61**	0.23	0.3	**26**
Sum of PFAS	µg/L	0.01	0.15	0.16	6	0.23	0.43	**61**	0.23	0.3	**26**
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	0.01		0.16						0.3	
Sum of PFAS (PFOS + PFOA)	µg/L	0.01		0.14						0.28	

		Date	13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023		13/03/2023	13/03/2023	
		Field ID	0089_SD335_230313	0089_QC104_230313		0089_SD335_230313	0089_QC204_230313		0089_SD340_230313	0089_QC108_230313		0089_SD340_230313	0089_QC208_230313	
		Matrix Type	Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
		Lab Report Number	EP2303087	EP2303087	RPD	EP2303087	972487	RPD	EP2303087	EP2303087	RPD	EP2303087	972487	RPD
	Unit	LOR												
Sample Preparation														
Moisture Content	%	0.1	31.1	27.1	14	31.1	31	0	32.8	28.3	15	32.8	28	16
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluoropropanesulfonic acid (PFPrS)	mg/kg	0.005					<0.005						<0.005	
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	0.0003	<0.0002	40	0.0003	<0.005	0
Perfluorononanesulfonic acid (PFNS)	mg/kg	0.005					<0.005						<0.005	
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS														
Sum of PFHxS and PFOS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	0.0003	<0.0002	40	0.0003	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	0.0003	<0.0002	40	0.0003	<0.01	0
Sum of PFAS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.05	0	0.0003	<0.0002	40	0.0003	<0.05	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	mg/kg	0.005					<0.005						<0.005	
Sum of PFAS (PFOS + PFOA)	mg/kg	0.005					<0.005						<0.005	

*RPDs have only been considered where a concentration is greater than 1 times the LOR.
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

		Date	13/03/2023	13/03/2023		13/03/2023	13/03/2023		14/03/2023	14/03/2023		14/03/2023	14/03/2023	
		Field ID	0089_SD363_230313	0089_QC112_230313		0089_SD363_230313	0089_QC212_230313		0089_SD346_230314	0089_QC117_230314		0089_SD346_230314	0089_QC217_230314	
		Matrix Type	Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
		Lab Report Number	EP2303087	EP2303087	RPD	EP2303087	972487	RPD	EP2303180	EP2303180	RPD	EP2303180	972487	RPD
	Unit	LOR												
Sample Preparation														
Moisture Content	%	0.1	30.9	29.9	3	30.9	30	3	29.2	28.0	4	29.2	32	9
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluoropropanesulfonic acid (PFPrS)	mg/kg	0.005					<0.005						<0.005	
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	<0.0002	0.0002	0	<0.0002	<0.005	0	0.0004	0.0004	0	0.0004	<0.005	0
Perfluorononanesulfonic acid (PFNS)	mg/kg	0.005					<0.005						<0.005	
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS														
Sum of PFHxS and PFOS	mg/kg	0.0002	<0.0002	0.0002	0	<0.0002	<0.005	0	0.0004	0.0004	0	0.0004	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002	<0.0002	0.0002	0	<0.0002	<0.01	0	0.0004	0.0004	0	0.0004	<0.01	0
Sum of PFAS	mg/kg	0.0002	<0.0002	0.0002	0	<0.0002	<0.05	0	0.0004	0.0004	0	0.0004	<0.05	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	mg/kg	0.005					<0.005						<0.005	
Sum of PFAS (PFOS + PFOA)	mg/kg	0.005					<0.005						<0.005	

APPENDIX

C

LABORATORY CERTIFICATES

Cardno

now

Stantec

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2303084

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

49549 49552 49553 49551 49556 **Phone:** ( )

ALS Compass COC Reference: **# Samples:** 49561 49555 **Sampler:** [redacted]

Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by: CARDNO	**Received by:** [redacted]	**Relinquished by:**	**Received by:**
Date / Time: 13/03/23	**Date / Time:** 14/3 10am	**Date / Time:**	**Date / Time:**

CHAIN OF CUSTODY

(ALS) COC#: 49552 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW171	Extra Lab QAQC PFAS	13/03/2023 09:12 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
002	0089_QC103		13/03/2023 09:13 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW172		13/03/2023 10:25 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
004	0089_MW166		13/03/2023 10:23 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
005	0089_MW161		13/03/2023 10:45 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
006	0089_MW158		13/03/2023 11:01 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
007	0089_MW199		13/03/2023 11:51 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
008	0089_QC111		13/03/2023 11:55 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_MW195D		13/03/2023 12:42 PM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS

CHAIN OF CUSTODY

ALS COC#: 49552 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW195S		13/03/2023 01:07 PM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
011	0089_QC113		13/03/2023 01:10 PM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_MW193		13/03/2023 01:35 PM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
013	0089_MW173		13/03/2023 02:00 PM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS

CHAIN OF CUSTODY

ALS COC#: 49552 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted] CONTACT PH [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW171	Clear Plastic Bottle - Natural	125 mL	00070522189211	Green	No	
001	0089_MW171	HDPE (no PTFE)	20 mL	00350522039164	Grey	No	
001	0089_MW171	HDPE (no PTFE)	20 mL	00350821008487	Grey	No	
001	0089_MW171	HDPE (no PTFE)	20 mL	00350522039111	Grey	No	
001	0089_MW171	HDPE (no PTFE)	20 mL	00350821008386	Grey	No	
002	0089_QC103	Clear Plastic Bottle - Natural	125 mL	00070522171363	Green	No	
002	0089_QC103	HDPE (no PTFE)	20 mL	00350522039151	Grey	No	
002	0089_QC103	HDPE (no PTFE)	20 mL	00350522039140	Grey	No	
003	0089_MW172	Clear Plastic Bottle - Natural	125 mL	00070522171536	Green	No	
003	0089_MW172	HDPE (no PTFE)	20 mL	00350821008316	Grey	No	
003	0089_MW172	HDPE (no PTFE)	20 mL	00350821008376	Grey	No	
003	0089_MW172	HDPE (no PTFE)	20 mL	00350522039071	Grey	No	
003	0089_MW172	HDPE (no PTFE)	20 mL	00350522039172	Grey	No	
004	0089_MW166	Clear Plastic Bottle - Natural	125 mL	00070522189291	Green	No	
004	0089_MW166	HDPE (no PTFE)	20 mL	00350821008266	Grey	No	
004	0089_MW166	HDPE (no PTFE)	20 mL	00350821008304	Grey	No	
004	0089_MW166	HDPE (no PTFE)	20 mL	00350821008547	Grey	No	
004	0089_MW166	HDPE (no PTFE)	20 mL	00350821008363	Grey	No	
005	0089_MW161	Clear Plastic Bottle - Natural	125 mL	00070522171452	Green	No	
005	0089_MW161	HDPE (no PTFE)	20 mL	00350821008500	Grey	No	
005	0089_MW161	HDPE (no PTFE)	20 mL	00350522039118	Grey	No	
005	0089_MW161	HDPE (no PTFE)	20 mL	00350821008467	Grey	No	
005	0089_MW161	HDPE (no PTFE)	20 mL	00350522039035	Grey	No	
006	0089_MW158	Clear Plastic Bottle - Natural	125 mL	00070522171480	Green	No	
006	0089_MW158	HDPE (no PTFE)	20 mL	00350522039022	Grey	No	
006	0089_MW158	HDPE (no PTFE)	20 mL	00350821008491	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 49552 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

006	0089_MW158	HDPE (no PTFE)	20 mL	00350821008264	Grey	No	
006	0089_MW158	HDPE (no PTFE)	20 mL	00350522039231	Grey	No	
007	0089_MW199	HDPE (no PTFE)	20 mL	00350821008407	Grey	No	
007	0089_MW199	HDPE (no PTFE)	20 mL	00350821008544	Grey	No	
007	0089_MW199	HDPE (no PTFE)	20 mL	00350821008345	Grey	No	
007	0089_MW199	HDPE (no PTFE)	20 mL	00350821008507	Grey	No	
007	0089_MW199	Clear Plastic Bottle - Natural	125 mL	00070522189285	Green	No	
008	0089_QC111	HDPE (no PTFE)	20 mL	00350522039051	Grey	No	
008	0089_QC111	HDPE (no PTFE)	20 mL	00350522039259	Grey	No	
008	0089_QC111	Clear Plastic Bottle - Natural	125 mL	00070522171470	Green	No	
009	0089_MW195D	Clear Plastic Bottle - Natural	125 mL	00070522171585	Green	No	
009	0089_MW195D	HDPE (no PTFE)	20 mL	00350522039029	Grey	No	
009	0089_MW195D	HDPE (no PTFE)	20 mL	00350522039166	Grey	No	
009	0089_MW195D	HDPE (no PTFE)	20 mL	00350821008378	Grey	No	
009	0089_MW195D	HDPE (no PTFE)	20 mL	00350821008474	Grey	No	
010	0089_MW195S	HDPE (no PTFE)	20 mL	00350821008338	Grey	No	
010	0089_MW195S	HDPE (no PTFE)	20 mL	00350821008403	Grey	No	
010	0089_MW195S	HDPE (no PTFE)	20 mL	00350821008493	Grey	No	
010	0089_MW195S	HDPE (no PTFE)	20 mL	00350821008528	Grey	No	
010	0089_MW195S	Clear Plastic Bottle - Natural	125 mL	00070522171504	Green	No	
011	0089_QC113	HDPE (no PTFE)	20 mL	00350522039202	Grey	No	
011	0089_QC113	HDPE (no PTFE)	20 mL	00350522039181	Grey	No	
011	0089_QC113	Clear Plastic Bottle - Natural	125 mL	00070522171584	Green	No	
012	0089_MW193	Clear Plastic Bottle - Natural	125 mL	00070522171477	Green	No	
012	0089_MW193	HDPE (no PTFE)	20 mL	00350522039305	Grey	No	
012	0089_MW193	HDPE (no PTFE)	20 mL	00350821008360	Grey	No	
012	0089_MW193	HDPE (no PTFE)	20 mL	00350821008545	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 49552 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

012	0089_MW193	HDPE (no PTFE)	20 mL	00350522039179	Grey	No	
013	0089_MW173	Clear Plastic Bottle - Natural	125 mL	00070522189238	Green	No	
013	0089_MW173	HDPE (no PTFE)	20 mL	00350522039267	Grey	No	
013	0089_MW173	HDPE (no PTFE)	20 mL	00350821008323	Grey	No	
013	0089_MW173	HDPE (no PTFE)	20 mL	00350821008325	Grey	No	
013	0089_MW173	HDPE (no PTFE)	20 mL	00350522039264	Grey	No	

Total Bottle Count: ALS: 59, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EP2303084**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49552	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 14-Mar-2023 10:00	Issue Date	: 15-Mar-2023
Client Requested Due Date	: 22-Mar-2023	Scheduled Reporting Date	: **22-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 13 / 13

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EP2303084-001 : 13-Mar-2023 09:12 : 0089_MW171_230313 - Extra Lab QAQC PFAS

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2303084-001	13-Mar-2023 09:12	0089_MW171_230313 E...	✓	✓
EP2303084-002	13-Mar-2023 09:13	0089_QC103_230313	✓	✓
EP2303084-003	13-Mar-2023 10:25	0089_MW172_230313	✓	✓
EP2303084-004	13-Mar-2023 10:23	0089_MW166_230313	✓	✓
EP2303084-005	13-Mar-2023 10:45	0089_MW161_230313	✓	✓
EP2303084-006	13-Mar-2023 11:01	0089_MW158_230313	✓	✓
EP2303084-007	13-Mar-2023 11:51	0089_MW199_230313	✓	✓
EP2303084-008	13-Mar-2023 11:55	0089_QC111_230313	✓	✓
EP2303084-009	13-Mar-2023 12:42	0089_MW195D_230313	✓	✓
EP2303084-010	13-Mar-2023 13:07	0089_MW195S_230313	✓	✓
EP2303084-011	13-Mar-2023 13:10	0089_QC113_230313	✓	✓
EP2303084-012	13-Mar-2023 13:35	0089_MW193_230313	✓	✓
EP2303084-013	13-Mar-2023 14:00	0089_MW173_230313	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303085**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Mar-2023 10:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2023
C-O-C number	: 49555	Issue Date	: 22-Mar-2023 17:13
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW124_230313	0089_MW125_230313	0089_MW126_230313	0089_QC110_230313	0089_MW127_230313
				Sampling date / time	13-Mar-2023 08:53	13-Mar-2023 10:05	13-Mar-2023 11:23	13-Mar-2023 11:27	13-Mar-2023 11:54
Compound	CAS Number	LOR	Unit		EP2303085-001	EP2303085-002	EP2303085-003	EP2303085-004	EP2303085-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**346**	**379**	**655**	**648**	**528**
Total Alkalinity as CaCO3	----	1	mg/L		**346**	**379**	**655**	**648**	**528**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1980**	**2050**	**1640**	**1670**	**1750**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**16100**	**16800**	**17400**	**15400**	**14800**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**399**	**404**	**389**	**363**	**352**
Magnesium	7439-95-4	1	mg/L		**958**	**990**	**1050**	**963**	**940**
Sodium	7440-23-5	1	mg/L		**7520**	**7680**	**7630**	**7020**	**6810**
Potassium	7440-09-7	1	mg/L		**360**	**367**	**345**	**323**	**322**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**502**	**524**	**538**	**482**	**464**
ø Total Cations	----	0.01	meq/L		**435**	**445**	**446**	**411**	**399**
ø Ionic Balance	----	0.01	%		**7.17**	**8.16**	**9.30**	**7.97**	**7.54**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.03**	**0.20**	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.21**	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.75**	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.03**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.23**	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW124_230313	0089_MW125_230313	0089_MW126_230313	0089_QC110_230313	0089_MW127_230313
				Sampling date / time	13-Mar-2023 08:53	13-Mar-2023 10:05	13-Mar-2023 11:23	13-Mar-2023 11:27	13-Mar-2023 11:54
Compound	CAS Number	LOR	Unit		EP2303085-001	EP2303085-002	EP2303085-003	EP2303085-004	EP2303085-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW124_230313	0089_MW125_230313	0089_MW126_230313	0089_QC110_230313	0089_MW127_230313
				Sampling date / time	13-Mar-2023 08:53	13-Mar-2023 10:05	13-Mar-2023 11:23	13-Mar-2023 11:27	13-Mar-2023 11:54
Compound	CAS Number	LOR	Unit		EP2303085-001	EP2303085-002	EP2303085-003	EP2303085-004	EP2303085-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.03**	**1.42**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.75**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	**1.21**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**116**	**114**	**110**	**112**
13C8-PFOA	----	0.02	%		**112**	**107**	**99.5**	**106**	**106**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW202_230313	0089_MW203_230313	----	----	----
				Sampling date / time	13-Mar-2023 13:00	13-Mar-2023 14:15	----	----	----
Compound	CAS Number	LOR	Unit		EP2303085-006	EP2303085-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	8	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		200	318	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		200	326	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		67	172	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		161	90	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		80	48	----	----	----
Magnesium	7439-95-4	1	mg/L		25	58	----	----	----
Sodium	7440-23-5	1	mg/L		129	104	----	----	----
Potassium	7440-09-7	1	mg/L		7	13	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		9.93	12.6	----	----	----
ø Total Cations	----	0.01	meq/L		11.8	12.0	----	----	----
ø Ionic Balance	----	0.01	%		8.76	2.47	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.01	0.04	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.02	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW202_230313	0089_MW203_230313	----	----	----
				Sampling date / time	13-Mar-2023 13:00	13-Mar-2023 14:15	----	----	----
Compound	CAS Number	LOR	Unit		EP2303085-006	EP2303085-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW202_230313	0089_MW203_230313	----	----	----
				Sampling date / time	13-Mar-2023 13:00	13-Mar-2023 14:15	----	----	----
Compound	CAS Number	LOR	Unit		EP2303085-006	EP2303085-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.03**	**0.06**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.03**	**0.04**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	**0.06**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**113**	**77.0**	----	----	----
13C8-PFOA	----	0.02	%		**105**	**73.8**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303085**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2023
C-O-C number	: 49555	Issue Date	: 22-Mar-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4934494)									
EP2303084-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	465	466	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	465	466	0.4	0% - 20%
EP2303084-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	670	669	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	670	669	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4931945)									
EP2303084-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	598	594	0.7	0% - 20%
EP2303084-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	273	269	1.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4931946)									
EP2303084-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	5080	5190	2.1	0% - 20%
EP2303084-011	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	920	915	0.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4931682)									
EP2303084-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	195	194	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	391	391	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2600	2600	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	105	106	0.0	0% - 20%
EP2303084-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	150	154	2.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	115	116	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	485	487	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	36	37	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4937585)									
EP2303085-001	0089_MW124_230313	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4937585)									
EP2303085-001	0089_MW124_230313	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4937585)									
EP2303085-001	0089_MW124_230313	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4937585)									
EP2303085-001	0089_MW124_230313	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4937585) - continued									
EP2303085-001	0089_MW124_230313	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4937585)									
EP2303085-001	0089_MW124_230313	EP231X: Sum of PFAS	----	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.03	0.03	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4934494)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	101	87.8	118
				<1	200 mg/L	104	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4931945)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	89.9	112
				<1	500 mg/L	99.9	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4931946)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	106	88.6	113
				<1	1000 mg/L	103	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4931682)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	111	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	106	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937585)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	95.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	100	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	90.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	96.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	94.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	77.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937585)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	97.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	88.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	90.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	92.4	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937585) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	96.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	86.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937585)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	86.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	75.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	74.2	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	91.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	87.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	94.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	87.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937585)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	94.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	99.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	102	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	96.7	64.2	133
EP231P: PFAS Sums (QCLot: 4937585)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4931945)							
EP2303084-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4931946)							
EP2303084-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937585)							
EP2303085-007	0089_MW203_230313	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	93.7	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	101	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	91.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	99.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	101	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	76.1	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937585)							
EP2303085-007	0089_MW203_230313	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	89.1	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	87.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	96.7	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	89.9	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	100	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	88.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	87.4	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	90.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	90.1	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	85.9	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	84.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937585)							
EP2303085-007	0089_MW203_230313	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	86.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	73.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	76.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	74.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	83.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	82.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	85.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937585)							
EP2303085-007	0089_MW203_230313	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	86.9	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	80.2	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303085**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Mar-2023
Site	: Stirling GW - JS	Issue Date	: 22-Mar-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2303084--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2303084--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW124_230313, 0089_MW125_230313, 0089_MW126_230313, 0089_QC110_230313, 0089_MW127_230313, 0089_MW202_230313, 0089_MW203_230313	**13-Mar-2023**	**----**	----	----	**17-Mar-2023**	27-Mar-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW124_230313, 0089_MW125_230313, 0089_MW126_230313, 0089_QC110_230313, 0089_MW127_230313, 0089_MW202_230313, 0089_MW203_230313	**13-Mar-2023**	**----**	----	----	**22-Mar-2023**	10-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW124_230313, 0089_MW125_230313, 0089_MW126_230313, 0089_QC110_230313, 0089_MW127_230313, 0089_MW202_230313, 0089_MW203_230313	**13-Mar-2023**	**----**	----	----	**22-Mar-2023**	10-Apr-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW124_230313, 0089_MW125_230313, 0089_MW126_230313, 0089_QC110_230313, 0089_MW127_230313, 0089_MW202_230313, 0089_MW203_230313	**13-Mar-2023**	**----**	----	----	**17-Mar-2023**	20-Mar-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW124_230313, 0089_MW125_230313, 0089_MW126_230313, 0089_QC110_230313, 0089_MW127_230313, 0089_MW202_230313, 0089_MW203_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW124_230313, 0089_MW125_230313, 0089_MW126_230313, 0089_QC110_230313, 0089_MW127_230313, 0089_MW202_230313, 0089_MW203_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW124_230313, 0089_MW125_230313, 0089_MW126_230313, 0089_QC110_230313, 0089_MW127_230313, 0089_MW202_230313, 0089_MW203_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW124_230313, 0089_MW125_230313, 0089_MW126_230313, 0089_QC110_230313, 0089_MW127_230313, 0089_MW202_230313, 0089_MW203_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW124_230313, 0089_MW125_230313, 0089_MW126_230313, 0089_QC110_230313, 0089_MW127_230313, 0089_MW202_230313, 0089_MW203_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2303085

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec

ALS Compass COC Reference: 49549 49552 **# Samples:** 49553 49551 ~~49556~~ 49561 49555

Project Manager [redacted]
Phone: ( )

Sampler: [redacted]
Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by: CARDNO	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 13/03/23	Date / Time: 14/3 10am	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 49555 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW124		13/03/2023 08:53 AM	WATER	ALS: 5 Non ALS: 0	No		X		
002	0089_MW125		13/03/2023 10:05 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_MW126		13/03/2023 11:23 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_QC110		13/03/2023 11:27 AM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_MW127		13/03/2023 11:54 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
006	0089_MW202		13/03/2023 01:00 PM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0089_MW203		13/03/2023 02:15 PM	WATER	ALS: 5 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: 49555 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
005	0089_MW127	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 49555 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW124	Clear Plastic Bottle - Natural	125 mL	00070522171596	Green	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350821008406	Grey	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350821008458	Grey	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350019041248	Grey	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350019041339	Grey	No	
002	0089_MW125	Clear Plastic Bottle - Natural	125 mL	00070522189325	Green	No	
002	0089_MW125	HDPE (no PTFE)	20 mL	00350821008289	Grey	No	
002	0089_MW125	HDPE (no PTFE)	20 mL	00350821008308	Grey	No	
003	0089_MW126	Clear Plastic Bottle - Natural	125 mL	00070522171599	Green	No	
003	0089_MW126	HDPE (no PTFE)	20 mL	00350821008452	Grey	No	
003	0089_MW126	HDPE (no PTFE)	20 mL	00350821008296	Grey	No	
004	0089_QC110	Clear Plastic Bottle - Natural	125 mL	00070522171512	Green	No	
004	0089_QC110	HDPE (no PTFE)	20 mL	00350821008392	Grey	No	
004	0089_QC110	HDPE (no PTFE)	20 mL	00350821008364	Grey	No	
005	0089_MW127	Clear Plastic Bottle - Natural	125 mL	00070522171519	Green	No	
005	0089_MW127	HDPE (no PTFE)	20 mL	00350821008526	Grey	No	
005	0089_MW127	HDPE (no PTFE)	20 mL	00350821008418	Grey	No	
006	0089_MW202	HDPE (no PTFE)	20 mL	00350821008368	Grey	No	
006	0089_MW202	HDPE (no PTFE)	20 mL	00350821008310	Grey	No	
006	0089_MW202	Clear Plastic Bottle - Natural	125 mL	00070522189346	Green	No	
007	0089_MW203	Clear Plastic Bottle - Natural	125 mL	00070522189259	Green	No	
007	0089_MW203	HDPE (no PTFE)	20 mL	00350821008362	Grey	No	
007	0089_MW203	HDPE (no PTFE)	20 mL	00350821008313	Grey	No	
007	0089_MW203	HDPE (no PTFE)	20 mL	00350821000534	Grey	No	
007	0089_MW203	HDPE (no PTFE)	20 mL	00350821000602	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 49555 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A

Random Sample Temperature on Receipt: °C

Other comments:

Total Bottle Count: ALS: 25, Non ALS: 0

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2303085**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49555	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 14-Mar-2023 10:00	Issue Date	: 15-Mar-2023
Client Requested Due Date	: 22-Mar-2023	Scheduled Reporting Date	: **22-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2303085-001	13-Mar-2023 08:53	0089_MW124_230313		✓	✓		
EP2303085-002	13-Mar-2023 10:05	0089_MW125_230313		✓	✓		
EP2303085-003	13-Mar-2023 11:23	0089_MW126_230313		✓	✓		
EP2303085-004	13-Mar-2023 11:27	0089_QC110_230313		✓	✓		
EP2303085-005	13-Mar-2023 11:54	0089_MW127_230313	✓	✓		✓	✓
EP2303085-006	13-Mar-2023 13:00	0089_MW202_230313		✓	✓		
EP2303085-007	13-Mar-2023 14:15	0089_MW203_230313		✓	✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303086**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Mar-2023 10:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2023
C-O-C number	: 49556	Issue Date	: 22-Mar-2023 19:03
Sampler	: [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 18		
No. of samples analysed	: 18		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SW130_230313	0089_QC102_230313	0089_PW335_230313	0089_PW364_230313	0089_QC106_230313
				Sampling date / time	13-Mar-2023 09:08	13-Mar-2023 09:09	13-Mar-2023 09:23	13-Mar-2023 09:46	13-Mar-2023 09:50
					EP2303086-001	EP2303086-002	EP2303086-003	EP2303086-004	EP2303086-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**137**	**135**	**159**	**190**	**191**
Total Alkalinity as CaCO3	----	1	mg/L		**137**	**135**	**159**	**190**	**191**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2800**	**2830**	**3240**	**3280**	**3280**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20100**	**20200**	**23100**	**23200**	**23100**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**466**	**466**	**542**	**531**	**518**
Magnesium	7439-95-4	1	mg/L		**1470**	**1480**	**1740**	**1720**	**1670**
Sodium	7440-23-5	1	mg/L		**11900**	**11900**	**14000**	**13900**	**13600**
Potassium	7440-09-7	1	mg/L		**569**	**572**	**672**	**721**	**702**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**628**	**631**	**722**	**726**	**724**
ø Total Cations	----	0.01	meq/L		**676**	**677**	**796**	**791**	**773**
ø Ionic Balance	----	0.01	%		**3.71**	**3.50**	**4.88**	**4.26**	**3.28**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.01**	**0.02**	**0.14**	**0.01**	**0.02**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.02**	**0.03**	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_230313	0089_QC102_230313	0089_PW335_230313	0089_PW364_230313	0089_QC106_230313
				Sampling date / time	13-Mar-2023 09:08	13-Mar-2023 09:09	13-Mar-2023 09:23	13-Mar-2023 09:46	13-Mar-2023 09:50
Compound	CAS Number	LOR	Unit		EP2303086-001	EP2303086-002	EP2303086-003	EP2303086-004	EP2303086-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_230313	0089_QC102_230313	0089_PW335_230313	0089_PW364_230313	0089_QC106_230313
				Sampling date / time	13-Mar-2023 09:08	13-Mar-2023 09:09	13-Mar-2023 09:23	13-Mar-2023 09:46	13-Mar-2023 09:50
Compound	CAS Number	LOR	Unit		EP2303086-001	EP2303086-002	EP2303086-003	EP2303086-004	EP2303086-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.03**	**0.05**	**0.14**	**0.01**	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	**0.02**	**0.14**	**0.01**	**0.02**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	**0.05**	**0.14**	**0.01**	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**108**	**104**	**97.2**	**95.8**	**94.4**
13C8-PFOA	----	0.02	%		**101**	**104**	**97.5**	**100**	**101**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW132_230313	0089_PW340_230313	0089_PW362_230313	0089_QC109_230313	0089_SW134_230313
				Sampling date / time	13-Mar-2023 10:03	13-Mar-2023 10:07	13-Mar-2023 10:55	13-Mar-2023 10:55	13-Mar-2023 11:05
Compound	CAS Number	LOR	Unit		EP2303086-006	EP2303086-007	EP2303086-008	EP2303086-009	EP2303086-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		129	235	194	198	124
Total Alkalinity as CaCO3	----	1	mg/L		129	235	194	198	124
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2930	3280	3430	3250	2810
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19900	23200	24200	22700	20000
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		458	532	545	532	463
Magnesium	7439-95-4	1	mg/L		1450	1680	1740	1700	1470
Sodium	7440-23-5	1	mg/L		11700	13400	14000	13600	11800
Potassium	7440-09-7	1	mg/L		560	652	676	654	566
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		625	727	758	712	625
ø Total Cations	----	0.01	meq/L		665	764	797	775	672
ø Ionic Balance	----	0.01	%		3.14	2.48	2.49	4.22	3.60
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.04	0.03	0.03	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW132_230313	0089_PW340_230313	0089_PW362_230313	0089_QC109_230313	0089_SW134_230313
				Sampling date / time	13-Mar-2023 10:03	13-Mar-2023 10:07	13-Mar-2023 10:55	13-Mar-2023 10:55	13-Mar-2023 11:05
Compound	CAS Number	LOR	Unit		EP2303086-006	EP2303086-007	EP2303086-008	EP2303086-009	EP2303086-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW132_230313	0089_PW340_230313	0089_PW362_230313	0089_QC109_230313	0089_SW134_230313
				Sampling date / time	13-Mar-2023 10:03	13-Mar-2023 10:07	13-Mar-2023 10:55	13-Mar-2023 10:55	13-Mar-2023 11:05
Compound	CAS Number	LOR	Unit		EP2303086-006	EP2303086-007	EP2303086-008	EP2303086-009	EP2303086-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	**0.04**	**0.03**	**0.03**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.04**	**0.03**	**0.03**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	**0.04**	**0.03**	**0.03**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.2**	**103**	**94.1**	**97.3**	**97.1**
13C8-PFOA	----	0.02	%		**100**	**98.8**	**101**	**99.3**	**99.4**

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW341_230313	0089_PW363_230313	0089_SW305_230313	0089_QC114_230313	0089_PW304_230313
				Sampling date / time	13-Mar-2023 11:11	13-Mar-2023 11:50	13-Mar-2023 13:08	13-Mar-2023 13:10	13-Mar-2023 13:24
					EP2303086-011	EP2303086-012	EP2303086-013	EP2303086-014	EP2303086-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**129**	**158**	**126**	**127**	**150**
Total Alkalinity as CaCO3	----	1	mg/L		**129**	**158**	**126**	**127**	**150**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2910**	**3250**	**2760**	**2710**	**2970**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20500**	**23000**	**19700**	**19900**	**21000**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**470**	**542**	**447**	**450**	**493**
Magnesium	7439-95-4	1	mg/L		**1480**	**1710**	**1430**	**1430**	**1530**
Sodium	7440-23-5	1	mg/L		**12000**	**13800**	**11400**	**11500**	**12500**
Potassium	7440-09-7	1	mg/L		**579**	**670**	**549**	**548**	**598**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**641**	**720**	**616**	**620**	**657**
ø Total Cations	----	0.01	meq/L		**682**	**785**	**650**	**654**	**710**
ø Ionic Balance	----	0.01	%		**3.07**	**4.36**	**2.70**	**2.67**	**3.83**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.01**	**0.01**	**0.01**	**0.01**	**0.05**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW341_230313	0089_PW363_230313	0089_SW305_230313	0089_QC114_230313	0089_PW304_230313
				Sampling date / time	13-Mar-2023 11:11	13-Mar-2023 11:50	13-Mar-2023 13:08	13-Mar-2023 13:10	13-Mar-2023 13:24
					EP2303086-011	EP2303086-012	EP2303086-013	EP2303086-014	EP2303086-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW341_230313	0089_PW363_230313	0089_SW305_230313	0089_QC114_230313	0089_PW304_230313
				Sampling date / time	13-Mar-2023 11:11	13-Mar-2023 11:50	13-Mar-2023 13:08	13-Mar-2023 13:10	13-Mar-2023 13:24
Compound	CAS Number	LOR	Unit		EP2303086-011	EP2303086-012	EP2303086-013	EP2303086-014	EP2303086-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.01**	**0.01**	**0.01**	**0.01**	**0.06**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	**0.01**	**0.01**	**0.01**	**0.06**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	**0.01**	**0.01**	**0.01**	**0.06**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.6**	**98.2**	**95.6**	**94.0**	**99.1**
13C8-PFOA	----	0.02	%		**98.3**	**97.6**	**100**	**99.1**	**97.7**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC115_230313	0089_SW371_230313	0089_PW368_230313	----	----
				Sampling date / time	13-Mar-2023 13:27	13-Mar-2023 13:54	13-Mar-2023 13:45	----	----
Compound	CAS Number	LOR	Unit		EP2303086-016	EP2303086-017	EP2303086-018	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		151	124	902	----	----
Total Alkalinity as CaCO3	----	1	mg/L		151	124	902	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2990	2810	2980	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		21500	20400	25200	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		489	449	615	----	----
Magnesium	7439-95-4	1	mg/L		1520	1420	1730	----	----
Sodium	7440-23-5	1	mg/L		12400	11500	14000	----	----
Potassium	7440-09-7	1	mg/L		595	550	684	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		672	636	791	----	----
ø Total Cations	----	0.01	meq/L		704	654	800	----	----
ø Ionic Balance	----	0.01	%		2.35	1.33	0.54	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.06	0.07	0.04	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC115_230313	0089_SW371_230313	0089_PW368_230313	----	----
				Sampling date / time	13-Mar-2023 13:27	13-Mar-2023 13:54	13-Mar-2023 13:45	----	----
Compound	CAS Number	LOR	Unit		EP2303086-016	EP2303086-017	EP2303086-018	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_QC115_230313	0089_SW371_230313	0089_PW368_230313	----	----
			Sampling date / time	13-Mar-2023 13:27	13-Mar-2023 13:54	13-Mar-2023 13:45	----	----
Compound	CAS Number	LOR	Unit	EP2303086-016	EP2303086-017	EP2303086-018	--------	--------
				Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	**0.07**	**0.07**	**0.04**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	**0.07**	**0.07**	**0.04**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	**0.07**	**0.07**	**0.04**	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**99.4**	**99.7**	**99.3**	----	----
13C8-PFOA	----	0.02	%	**100**	**98.3**	**102**	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303086**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2023
C-O-C number	: 49556	Issue Date	: 22-Mar-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 18		
No. of samples analysed	: 18		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4934498)									
EP2303086-002	0089_QC102_230313	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	135	135	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	135	135	0.0	0% - 20%
EP2303086-012	0089_PW363_230313	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	158	159	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	158	159	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4931947)									
EP2303086-001	0089_SW130_230313	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2800	2810	0.4	0% - 20%
EP2303086-011	0089_PW341_230313	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2910	2880	0.8	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4931948)									
EP2303086-001	0089_SW130_230313	ED045G: Chloride	16887-00-6	1	mg/L	20100	20000	0.2	0% - 20%
EP2303086-011	0089_PW341_230313	ED045G: Chloride	16887-00-6	1	mg/L	20500	20400	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4931683)									
EP2303086-001	0089_SW130_230313	ED093F: Calcium	7440-70-2	1	mg/L	466	468	0.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1470	1480	0.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11900	11900	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	569	572	0.6	0% - 20%
EP2303086-011	0089_PW341_230313	ED093F: Calcium	7440-70-2	1	mg/L	470	470	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1480	1470	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	12000	0.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	579	575	0.7	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4933592)									
EP2303086-006	0089_SW132_230313	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2303086-010	0089_SW134_230313	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4933592)									
EP2303086-006	0089_SW132_230313	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.02	0.03	45.1	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2303086-010	0089_SW134_230313	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4933592)									
EP2303086-006	0089_SW132_230313	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4933592) - continued									
EP2303086-006	0089_SW132_230313	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303086-010	0089_SW134_230313	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4933592)									
EP2303086-006	0089_SW132_230313	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303086-010	0089_SW134_230313	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4933592)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4933592) - continued									
EP2303086-006	0089_SW132_230313	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.03	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.03	40.0	No Limit
EP2303086-010	0089_SW134_230313	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4934498)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	99.9	87.8	118
				<1	200 mg/L	102	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4931947)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	89.9	112
				<1	500 mg/L	98.7	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4931948)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	88.6	113
				<1	1000 mg/L	100	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4931683)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	105	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.1	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4933592)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	91.1	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	84.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	91.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	83.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4933592)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	95.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	98.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	93.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	90.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	89.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	87.6	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4933592) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	77.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4933592)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	92.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	101	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	105	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.9	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	96.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	95.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4933592)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	75.5	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	95.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	87.1	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	93.4	64.2	133
EP231P: PFAS Sums (QCLot: 4933592)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4931947)							
EP2303086-001	0089_SW130_230313	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4931948)							
EP2303086-001	0089_SW130_230313	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4933592)							
EP2303086-007	0089_PW340_230313	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	90.6	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	83.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	93.1	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	89.3	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	113	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	83.2	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4933592)							
EP2303086-007	0089_PW340_230313	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.6	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	105	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	98.8	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	92.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	88.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	82.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	87.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	88.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	86.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	88.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4933592)							
EP2303086-007	0089_PW340_230313	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	87.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	98.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	76.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	96.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	83.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	91.0	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	100.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4933592)							
EP2303086-007	0089_PW340_230313	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	77.8	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	92.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	94.8	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	110	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303086**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Mar-2023
Site	: Stirling SW/PW - JS	Issue Date	: 22-Mar-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 18
Order number	: pfas-omp/Stirling	No. of samples analysed	: 18

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2303086--001	0089_SW130_230313	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2303086--001	0089_SW130_230313	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW130_230313,	0089_QC102_230313,	**13-Mar-2023**	**----**	----	----	**17-Mar-2023**	27-Mar-2023	✓
0089_PW335_230313,	0089_PW364_230313,							
0089_QC106_230313,	0089_SW132_230313,							
0089_PW340_230313,	0089_PW362_230313,							
0089_QC109_230313,	0089_SW134_230313,							
0089_PW341_230313,	0089_PW363_230313,							
0089_SW305_230313,	0089_QC114_230313,							
0089_PW304_230313,	0089_QC115_230313,							
0089_SW371_230313,	0089_PW368_230313							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW130_230313, 0089_QC102_230313, 0089_PW335_230313, 0089_PW364_230313, 0089_QC106_230313, 0089_SW132_230313, 0089_PW340_230313, 0089_PW362_230313, 0089_QC109_230313, 0089_SW134_230313, 0089_PW341_230313, 0089_PW363_230313, 0089_SW305_230313, 0089_QC114_230313, 0089_PW304_230313, 0089_QC115_230313, 0089_SW371_230313, 0089_PW368_230313	**13-Mar-2023**	**----**	----	----	**22-Mar-2023**	10-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW130_230313, 0089_QC102_230313, 0089_PW335_230313, 0089_PW364_230313, 0089_QC106_230313, 0089_SW132_230313, 0089_PW340_230313, 0089_PW362_230313, 0089_QC109_230313, 0089_SW134_230313, 0089_PW341_230313, 0089_PW363_230313, 0089_SW305_230313, 0089_QC114_230313, 0089_PW304_230313, 0089_QC115_230313, 0089_SW371_230313, 0089_PW368_230313	**13-Mar-2023**	**----**	----	----	**22-Mar-2023**	10-Apr-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW130_230313, 0089_QC102_230313, 0089_PW335_230313, 0089_PW364_230313, 0089_QC106_230313, 0089_SW132_230313, 0089_PW340_230313, 0089_PW362_230313, 0089_QC109_230313, 0089_SW134_230313, 0089_PW341_230313, 0089_PW363_230313, 0089_SW305_230313, 0089_QC114_230313, 0089_PW304_230313, 0089_QC115_230313, 0089_SW371_230313, 0089_PW368_230313	**13-Mar-2023**	**----**	----	----	**17-Mar-2023**	20-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW130_230313, 0089_QC102_230313, 0089_PW335_230313, 0089_PW364_230313, 0089_QC106_230313, 0089_SW132_230313, 0089_PW340_230313, 0089_PW362_230313, 0089_QC109_230313, 0089_SW134_230313, 0089_PW341_230313, 0089_PW363_230313, 0089_SW305_230313, 0089_QC114_230313, 0089_PW304_230313, 0089_QC115_230313, 0089_SW371_230313, 0089_PW368_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW130_230313, 0089_QC102_230313, 0089_PW335_230313, 0089_PW364_230313, 0089_QC106_230313, 0089_SW132_230313, 0089_PW340_230313, 0089_PW362_230313, 0089_QC109_230313, 0089_SW134_230313, 0089_PW341_230313, 0089_PW363_230313, 0089_SW305_230313, 0089_QC114_230313, 0089_PW304_230313, 0089_QC115_230313, 0089_SW371_230313, 0089_PW368_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW130_230313, 0089_QC102_230313, 0089_PW335_230313, 0089_PW364_230313, 0089_QC106_230313, 0089_SW132_230313, 0089_PW340_230313, 0089_PW362_230313, 0089_QC109_230313, 0089_SW134_230313, 0089_PW341_230313, 0089_PW363_230313, 0089_SW305_230313, 0089_QC114_230313, 0089_PW304_230313, 0089_QC115_230313, 0089_SW371_230313, 0089_PW368_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW130_230313, 0089_QC102_230313, 0089_PW335_230313, 0089_PW364_230313, 0089_QC106_230313, 0089_SW132_230313, 0089_PW340_230313, 0089_PW362_230313, 0089_QC109_230313, 0089_SW134_230313, 0089_PW341_230313, 0089_PW363_230313, 0089_SW305_230313, 0089_QC114_230313, 0089_PW304_230313, 0089_QC115_230313, 0089_SW371_230313, 0089_PW368_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW130_230313, 0089_QC102_230313, 0089_PW335_230313, 0089_PW364_230313, 0089_QC106_230313, 0089_SW132_230313, 0089_PW340_230313, 0089_PW362_230313, 0089_QC109_230313, 0089_SW134_230313, 0089_PW341_230313, 0089_PW363_230313, 0089_SW305_230313, 0089_QC114_230313, 0089_PW304_230313, 0089_QC115_230313, 0089_SW371_230313, 0089_PW368_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2303086

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

49549 49552 49553 49551 49556 49561 49555

ALS Compass COC Reference: **# Samples:** **Phone:** ( )

Sampler: [redacted]

Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by: CARDNO	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 13/03/23	Date / Time: 14/3 10am	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 49556 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW130		13/03/2023 09:08 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC102		13/03/2023 09:09 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW335		13/03/2023 09:23 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW364		13/03/2023 09:46 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_QC106		13/03/2023 09:50 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_SW132		13/03/2023 10:03 AM	WATER	ALS: 5 Non ALS: 0	No	X		
007	0089_PW340		13/03/2023 10:07 AM	WATER	ALS: 5 Non ALS: 0	No	X		
008	0089_PW362		13/03/2023 10:55 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_QC109		13/03/2023 10:55 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 49556 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SW134		13/03/2023 11:05 AM	WATER	ALS: 5 Non ALS: 0	No	X		
011	0089_PW341		13/03/2023 11:11 AM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_PW363		13/03/2023 11:50 AM	WATER	ALS: 5 Non ALS: 0	No	X		
013	0089_SW305		13/03/2023 01:08 PM	WATER	ALS: 3 Non ALS: 0	No	X		
014	0089_QC114		13/03/2023 01:10 PM	WATER	ALS: 3 Non ALS: 0	No	X		
015	0089_PW304		13/03/2023 01:24 PM	WATER	ALS: 3 Non ALS: 0	No	X		
016	0089_QC115		13/03/2023 01:27 PM	WATER	ALS: 3 Non ALS: 0	No	X		
017	0089_SW371		13/03/2023 01:54 PM	WATER	ALS: 3 Non ALS: 0	No	X		
018	0089_PW368		13/03/2023 01:45 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 49556 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW130	Clear Plastic Bottle - Natural	125 mL	00070522171545	Green	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00350522039215	Grey	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00350522039049	Grey	No	
002	0089_QC102	Clear Plastic Bottle - Natural	125 mL	00070522189220	Green	No	
002	0089_QC102	HDPE (no PTFE)	20 mL	00350821008306	Grey	No	
002	0089_QC102	HDPE (no PTFE)	20 mL	00350821008302	Grey	No	
003	0089_PW335	Clear Plastic Bottle - Natural	125 mL	00070522189250	Green	No	
003	0089_PW335	HDPE (no PTFE)	20 mL	00350821008324	Grey	No	
003	0089_PW335	HDPE (no PTFE)	20 mL	00350821008275	Grey	No	
004	0089_PW364	Clear Plastic Bottle - Natural	125 mL	00070522171521	Green	No	
004	0089_PW364	HDPE (no PTFE)	20 mL	00350821008314	Grey	No	
004	0089_PW364	HDPE (no PTFE)	20 mL	00350821008485	Grey	No	
005	0089_QC106	Clear Plastic Bottle - Natural	125 mL	00070522171471	Green	No	
005	0089_QC106	HDPE (no PTFE)	20 mL	00350821008469	Grey	No	
005	0089_QC106	HDPE (no PTFE)	20 mL	00350821008427	Grey	No	
006	0089_SW132	HDPE (no PTFE)	20 mL	00350019015366	Grey	No	
006	0089_SW132	HDPE (no PTFE)	20 mL	00350019012123	Grey	No	
006	0089_SW132	Clear Plastic Bottle - Natural	125 mL	00070522189320	Green	No	
006	0089_SW132	HDPE (no PTFE)	20 mL	00350821008456	Grey	No	
006	0089_SW132	HDPE (no PTFE)	20 mL	00350821008373	Grey	No	
007	0089_PW340	Clear Plastic Bottle - Natural	125 mL	00070522171544	Green	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00350821008509	Grey	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00350821008432	Grey	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00350019041354	Grey	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00350019041342	Grey	No	
008	0089_PW362	HDPE (no PTFE)	20 mL	00350821008476	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 49556 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted] CONTACT PH [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_PW362	HDPE (no PTFE)	20 mL	00350821008495	Grey	No	
008	0089_PW362	Clear Plastic Bottle - Natural	125 mL	00070522171597	Green	No	
009	0089_QC109	Clear Plastic Bottle - Natural	125 mL	00070522171517	Green	No	
009	0089_QC109	HDPE (no PTFE)	20 mL	00350821008489	Grey	No	
009	0089_QC109	HDPE (no PTFE)	20 mL	00350821008265	Grey	No	
010	0089_SW134	Clear Plastic Bottle - Natural	125 mL	00070522171505	Green	No	
010	0089_SW134	HDPE (no PTFE)	20 mL	00350821008460	Grey	No	
010	0089_SW134	HDPE (no PTFE)	20 mL	00350821008333	Grey	No	
010	0089_SW134	HDPE (no PTFE)	20 mL	00350019041179	Grey	No	
010	0089_SW134	HDPE (no PTFE)	20 mL	00350019041158	Grey	No	
011	0089_PW341	Clear Plastic Bottle - Natural	125 mL	00070522189240	Green	No	
011	0089_PW341	HDPE (no PTFE)	20 mL	00350821008484	Grey	No	
011	0089_PW341	HDPE (no PTFE)	20 mL	00350821008410	Grey	No	
012	0089_PW363	HDPE (no PTFE)	20 mL	00350821008319	Grey	No	
012	0089_PW363	Clear Plastic Bottle - Natural	125 mL	00070522171508	Green	No	
012	0089_PW363	HDPE (no PTFE)	20 mL	00350821008369	Grey	No	
012	0089_PW363	HDPE (no PTFE)	20 mL	00350621000587	Grey	No	
012	0089_PW363	HDPE (no PTFE)	20 mL	00350821013007	Grey	No	
013	0089_SW305	Clear Plastic Bottle - Natural	125 mL	00070522171485	Green	No	
013	0089_SW305	HDPE (no PTFE)	20 mL	00350821008519	Grey	No	
013	0089_SW305	HDPE (no PTFE)	20 mL	00350821008542	Grey	No	
014	0089_QC114	Clear Plastic Bottle - Natural	125 mL	00070522171514	Green	No	
014	0089_QC114	HDPE (no PTFE)	20 mL	00350522039068	Grey	No	
014	0089_QC114	HDPE (no PTFE)	20 mL	00350522039117	Grey	No	
015	0089_PW304	Clear Plastic Bottle - Natural	125 mL	00070522171502	Green	No	
015	0089_PW304	HDPE (no PTFE)	20 mL	00350522039132	Grey	No	
015	0089_PW304	HDPE (no PTFE)	20 mL	00350522039311	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 49556 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

016	0089_QC115	HDPE (no PTFE)	20 mL	00350821008356	Grey	No	
016	0089_QC115	HDPE (no PTFE)	20 mL	00350821008443	Grey	No	
016	0089_QC115	Clear Plastic Bottle - Natural	125 mL	00070522171447	Green	No	
017	0089_SW371	Clear Plastic Bottle - Natural	125 mL	00070522189286	Green	No	
017	0089_SW371	HDPE (no PTFE)	20 mL	00350821008475	Grey	No	
017	0089_SW371	HDPE (no PTFE)	20 mL	00350821008279	Grey	No	
018	0089_PW368	Clear Plastic Bottle - Natural	125 mL	00070522189357	Green	No	
018	0089_PW368	HDPE (no PTFE)	20 mL	00350821008413	Grey	No	
018	0089_PW368	HDPE (no PTFE)	20 mL	00350821008348	Grey	No	

Total Bottle Count: ALS: 62, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2303086**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49556	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 14-Mar-2023 10:00	Issue Date	: 15-Mar-2023
Client Requested Due Date	: 22-Mar-2023	Scheduled Reporting Date	: **22-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 18 / 18

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2303086-001	13-Mar-2023 09:08	0089_SW130_230313	✓	✓
EP2303086-002	13-Mar-2023 09:09	0089_QC102_230313	✓	✓
EP2303086-003	13-Mar-2023 09:23	0089_PW335_230313	✓	✓
EP2303086-004	13-Mar-2023 09:46	0089_PW364_230313	✓	✓
EP2303086-005	13-Mar-2023 09:50	0089_QC106_230313	✓	✓
EP2303086-006	13-Mar-2023 10:03	0089_SW132_230313	✓	✓
EP2303086-007	13-Mar-2023 10:07	0089_PW340_230313	✓	✓
EP2303086-008	13-Mar-2023 10:55	0089_PW362_230313	✓	✓
EP2303086-009	13-Mar-2023 10:55	0089_QC109_230313	✓	✓
EP2303086-010	13-Mar-2023 11:05	0089_SW134_230313	✓	✓
EP2303086-011	13-Mar-2023 11:11	0089_PW341_230313	✓	✓
EP2303086-012	13-Mar-2023 11:50	0089_PW363_230313	✓	✓
EP2303086-013	13-Mar-2023 13:08	0089_SW305_230313	✓	✓
EP2303086-014	13-Mar-2023 13:10	0089_QC114_230313	✓	✓
EP2303086-015	13-Mar-2023 13:24	0089_PW304_230313	✓	✓
EP2303086-016	13-Mar-2023 13:27	0089_QC115_230313	✓	✓
EP2303086-017	13-Mar-2023 13:54	0089_SW371_230313	✓	✓
EP2303086-018	13-Mar-2023 13:45	0089_PW368_230313	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]

DERP LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303087**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Mar-2023 10:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49561	Issue Date	: 22-Mar-2023 17:08
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD335_230313	0089_QC104_230313	0089_SD364_230313	0089_SD340_230313	0089_QC108_230313
				Sampling date / time	13-Mar-2023 09:24	13-Mar-2023 09:26	13-Mar-2023 09:45	13-Mar-2023 10:10	13-Mar-2023 10:14
					EP2303087-001	EP2303087-002	EP2303087-003	EP2303087-004	EP2303087-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**31.1**	**27.1**	**30.0**	**32.8**	**28.3**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD335_230313	0089_QC104_230313	0089_SD364_230313	0089_SD340_230313	0089_QC108_230313
				Sampling date / time	13-Mar-2023 09:24	13-Mar-2023 09:26	13-Mar-2023 09:45	13-Mar-2023 10:10	13-Mar-2023 10:14
Compound	CAS Number	LOR	Unit		EP2303087-001	EP2303087-002	EP2303087-003	EP2303087-004	EP2303087-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**110**	**114**	**108**	**109**	**110**
13C8-PFOA	----	0.0002	%		**99.5**	**101**	**100**	**98.0**	**99.5**

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD362_230313	0089_SD341_230313	0089_SD363_230313	0089_QC112_230313	0089_SD304_230313
				Sampling date / time	13-Mar-2023 10:45	13-Mar-2023 11:12	13-Mar-2023 11:48	13-Mar-2023 11:48	13-Mar-2023 13:28
					EP2303087-006	EP2303087-007	EP2303087-008	EP2303087-009	EP2303087-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**32.6**	**31.0**	**30.9**	**29.9**	**34.5**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0002**	<0.0002	<0.0002	**0.0002**	**0.0004**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD362_230313	0089_SD341_230313	0089_SD363_230313	0089_QC112_230313	0089_SD304_230313
				Sampling date / time	13-Mar-2023 10:45	13-Mar-2023 11:12	13-Mar-2023 11:48	13-Mar-2023 11:48	13-Mar-2023 13:28
Compound	CAS Number	LOR	Unit		EP2303087-006	EP2303087-007	EP2303087-008	EP2303087-009	EP2303087-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0002**	<0.0002	<0.0002	**0.0002**	**0.0004**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0002**	<0.0002	<0.0002	**0.0002**	**0.0004**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0002**	<0.0002	<0.0002	**0.0002**	**0.0004**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**107**	**108**	**108**	**108**	**104**
13C8-PFOA	----	0.0002	%		**102**	**99.0**	**101**	**100**	**98.0**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD368_230313	----	----	----	----
				Sampling date / time	13-Mar-2023 13:48	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2303087-011	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**33.7**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0003**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD368_230313	----	----	----	----
				Sampling date / time	13-Mar-2023 13:48	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2303087-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0003**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0003**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0003**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**115**	----	----	----	----
13C8-PFOA	----	0.0002	%		**104**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303087**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49561	Issue Date	: 22-Mar-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4942025)									
EP2303087-001	0089_SD335_230313	EA055: Moisture Content	----	0.1	%	31.1	31.4	0.8	0% - 20%
EP2303087-010	0089_SD304_230313	EA055: Moisture Content	----	0.1	%	34.5	35.5	2.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4937631)									
EP2303087-001	0089_SD335_230313	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2303087-011	0089_SD368_230313	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4937631)									
EP2303087-001	0089_SD335_230313	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4937631) - continued									
EP2303087-001	0089_SD335_230313	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2303087-011	0089_SD368_230313	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4937631)									
EP2303087-001	0089_SD335_230313	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2303087-011	0089_SD368_230313	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4937631)									
EP2303087-001	0089_SD335_230313	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2303087-011	0089_SD368_230313	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4937631)									
EP2303087-001	0089_SD335_230313	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2303087-011	0089_SD368_230313	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937631)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	102	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	89.4	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	100	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	91.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	92.9	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937631)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	95.5	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	100	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937631)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	87.7	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.0	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.8	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937631)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	97.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	95.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	108	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937631) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	105	54.8	124
EP231P: PFAS Sums (QCLot: 4937631)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937631)							
EP2303087-002	0089_QC104_230313	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	95.5	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	84.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	89.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	100	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	98.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	97.7	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937631)							
EP2303087-002	0089_QC104_230313	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	96.8	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	91.7	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.1	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	92.1	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	94.8	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	97.7	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	94.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	90.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	96.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	92.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	97.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937631)							
EP2303087-002	0089_QC104_230313	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	97.7	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	88.3	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	91.3	60.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937631) - continued							
EP2303087-002	0089_QC104_230313	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	99.4	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	112	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	100	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937631)							
EP2303087-002	0089_QC104_230313	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	98.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	94.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	116	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	106	60.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303087**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Mar-2023
Site	: Stirling SD - JS	Issue Date	: 22-Mar-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 11
Order number	: pfas-omp/Stirling	No. of samples analysed	: 11

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD335_230313, 0089_QC104_230313, 0089_SD364_230313, 0089_SD340_230313, 0089_QC108_230313, 0089_SD362_230313, 0089_SD341_230313, 0089_SD363_230313, 0089_QC112_230313, 0089_SD304_230313, 0089_SD368_230313	**13-Mar-2023**	**----**	----	----	**21-Mar-2023**	27-Mar-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_230313, 0089_QC104_230313, 0089_SD364_230313, 0089_SD340_230313, 0089_QC108_230313, 0089_SD362_230313, 0089_SD341_230313, 0089_SD363_230313, 0089_QC112_230313, 0089_SD304_230313, 0089_SD368_230313	**13-Mar-2023**	**17-Mar-2023**	09-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_230313, 0089_QC104_230313, 0089_SD364_230313, 0089_SD340_230313, 0089_QC108_230313, 0089_SD362_230313, 0089_SD341_230313, 0089_SD363_230313, 0089_QC112_230313, 0089_SD304_230313, 0089_SD368_230313	**13-Mar-2023**	**17-Mar-2023**	09-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD335_230313, 0089_QC104_230313, 0089_SD364_230313, 0089_SD340_230313, 0089_QC108_230313, 0089_SD362_230313, 0089_SD341_230313, 0089_SD363_230313, 0089_QC112_230313, 0089_SD304_230313, 0089_SD368_230313	**13-Mar-2023**	**17-Mar-2023**	09-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_230313, 0089_QC104_230313, 0089_SD364_230313, 0089_SD340_230313, 0089_QC108_230313, 0089_SD362_230313, 0089_SD341_230313, 0089_SD363_230313, 0089_QC112_230313, 0089_SD304_230313, 0089_SD368_230313	**13-Mar-2023**	**17-Mar-2023**	09-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD335_230313, 0089_QC104_230313, 0089_SD364_230313, 0089_SD340_230313, 0089_QC108_230313, 0089_SD362_230313, 0089_SD341_230313, 0089_SD363_230313, 0089_QC112_230313, 0089_SD304_230313, 0089_SD368_230313	**13-Mar-2023**	**17-Mar-2023**	09-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2303119

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manage** [redacted]

49549 49552 ~~49553~~ ~~49551~~ 49556 49561 49555

ALS Compass COC Reference: **# Samples:** **Phone:** ( )

Sampler:

Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by: CARDNO	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 13/03/23	Date / Time: 14/3 10am	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 49549 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW123		13/03/2023 09:09 AM	WATER	ALS: 2 Non ALS: 1	No		X		
002	0089_QC101		13/03/2023 09:10 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_MW121		13/03/2023 09:34 AM	WATER	ALS: 5 Non ALS: 0	No		X		extra PFAS bottles for lab QC
004	0089_MW120		13/03/2023 09:55 AM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_QC105		13/03/2023 09:56 AM	WATER	ALS: 2 Non ALS: 0	No	X			
006	0089_MW112		13/03/2023 10:08 AM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0089_MW109		13/03/2023 10:24 AM	WATER	ALS: 3 Non ALS: 0	No		X		
008	0089_QC107		13/03/2023 10:25 AM	WATER	ALS: 2 Non ALS: 0	No	X			
009	0089_MW500		13/03/2023 10:41 AM	WATER	ALS: 5 Non ALS: 0	No		X		extra PFAS bottles for lab QC

CHAIN OF CUSTODY

ALS COC#: 49549 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free Ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW196		13/03/2023 11:51 AM	WATER	ALS: 2 Non ALS: 1	No		X		
011	0089_MW257		13/03/2023 12:18 PM	WATER	ALS: 3 Non ALS: 0	No		X		
012	0089_MW258		13/03/2023 12:30 PM	WATER	ALS: 5 Non ALS: 0	No		X		extra PFAS bottles for lab QC
013	0089_MW259		13/03/2023 12:45 PM	WATER	ALS: 2 Non ALS: 1	No		X		
014	0089_MW256		13/03/2023 01:00 PM	WATER	ALS: 3 Non ALS: 0	No		X		
015	0089_MW255		13/03/2023 01:14 PM	WATER	ALS: 3 Non ALS: 0	No		X		
016	0089_MW233		13/03/2023 01:32 PM	WATER	ALS: 3 Non ALS: 0	No		X		
017	0089_MW249		13/03/2023 01:45 PM	WATER	ALS: 3 Non ALS: 0	No		X		
018	0089_MW516		13/03/2023 02:00 PM	WATER	ALS: 3 Non ALS: 0	No		X		

CHAIN OF CUSTODY

(ALS) COC#: 49549 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0089_MW496		13/03/2023 02:13 PM	WATER	ALS: 3 Non ALS: 0	No		X		
020	0089_QC301		13/03/2023 02:35 PM	WATER	ALS: 2 Non ALS: 0	No	X			
021	0089_QC302		13/03/2023 02:35 PM	WATER	ALS: 2 Non ALS: 0	No	X			
022	0089_QC303		13/03/2023 02:36 PM	WATER	ALS: 2 Non ALS: 0	No	X			
023	0089_QC401		13/03/2023 02:25 PM	WATER	ALS: 1 Non ALS: 1	No	X			179
024	0089_QC402		13/03/2023 02:27 PM	WATER	ALS: 0 Non ALS: 2	No	X			180
025	0089_QC403		13/03/2023 02:27 PM	WATER	ALS: 0 Non ALS: 2	No	X			182

CHAIN OF CUSTODY

ALS COC#: 49549 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW123	Clear Plastic Bottle - Natural	125 mL	00070522189342	Green	No	
001	0089_MW123	HDPE (no PTFE)	20 mL	00350821008499	Grey	No	
002	0089_QC101	Clear Plastic Bottle - Natural	125 mL	00070522189273	Green	No	
002	0089_QC101	HDPE (no PTFE)	20 mL	00350821008388	Grey	No	
002	0089_QC101	HDPE (no PTFE)	20 mL	00350821008416	Grey	No	
003	0089_MW121	HDPE (no PTFE)	20 mL	00350621016915	Grey	No	
003	0089_MW121	Clear Plastic Bottle - Natural	125 mL	00070522171468	Green	No	
003	0089_MW121	HDPE (no PTFE)	20 mL	00350522039253	Grey	No	
003	0089_MW121	HDPE (no PTFE)	20 mL	00350522039149	Grey	No	
003	0089_MW121	HDPE (no PTFE)	20 mL	00350621016601	Grey	No	
004	0089_MW120	HDPE (no PTFE)	20 mL	00350522039167	Grey	No	
004	0089_MW120	HDPE (no PTFE)	20 mL	00350522039082	Grey	No	
004	0089_MW120	Clear Plastic Bottle - Natural	125 mL	00070522189244	Green	No	
005	0089_QC105	HDPE (no PTFE)	20 mL	00350522039153	Grey	No	
005	0089_QC105	HDPE (no PTFE)	20 mL	00350522039058	Grey	No	
006	0089_MW112	HDPE (no PTFE)	20 mL	00350821008346	Grey	No	
006	0089_MW112	Clear Plastic Bottle - Natural	125 mL	00070522189209	Green	No	
006	0089_MW112	HDPE (no PTFE)	20 mL	00350821008276	Grey	No	
007	0089_MW109	Clear Plastic Bottle - Natural	125 mL	00070522189294	Green	No	
007	0089_MW109	HDPE (no PTFE)	20 mL	00350821008332	Grey	No	
007	0089_MW109	HDPE (no PTFE)	20 mL	00350821008382	Grey	No	
008	0089_QC107	HDPE (no PTFE)	20 mL	00350821008327	Grey	No	
008	0089_QC107	HDPE (no PTFE)	20 mL	00350821008303	Grey	No	
009	0089_MW500	HDPE (no PTFE)	20 mL	00350621016954	Grey	No	
009	0089_MW500	Clear Plastic Bottle - Natural	125 mL	00070522171541	Green	No	
009	0089_MW500	HDPE (no PTFE)	20 mL	00350621016735	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 49549 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW500	HDPE (no PTFE)	20 mL	00350621016765	Grey	No	
009	0089_MW500	HDPE (no PTFE)	20 mL	00350621016969	Grey	No	
010	0089_MW196	Clear Plastic Bottle - Natural	125 mL	00070522189270	Green	No	
010	0089_MW196	HDPE (no PTFE)	20 mL	00350821008502	Grey	No	
011	0089_MW257	Clear Plastic Bottle - Natural	125 mL	00070522189239	Green	No	
011	0089_MW257	HDPE (no PTFE)	20 mL	00350522039189	Grey	No	
011	0089_MW257	HDPE (no PTFE)	20 mL	00350522039216	Grey	No	
012	0089_MW258	HDPE (no PTFE)	20 mL	00350621016699	Grey	No	
012	0089_MW258	HDPE (no PTFE)	20 mL	00350621016978	Grey	No	
012	0089_MW258	HDPE (no PTFE)	20 mL	00350621016678	Grey	No	
012	0089_MW258	HDPE (no PTFE)	20 mL	00350621016826	Grey	No	
012	0089_MW258	Clear Plastic Bottle - Natural	125 mL	00070522171553	Green	No	
013	0089_MW259	Clear Plastic Bottle - Natural	125 mL	00070522171515	Green	No	
013	0089_MW259	HDPE (no PTFE)	20 mL	00350522039238	Grey	No	
014	0089_MW256	Clear Plastic Bottle - Natural	125 mL	00070522171531	Green	No	
014	0089_MW256	HDPE (no PTFE)	20 mL	00350821008437	Grey	No	
014	0089_MW256	HDPE (no PTFE)	20 mL	00350821008448	Grey	No	
015	0089_MW255	Clear Plastic Bottle - Natural	125 mL	00070522171475	Green	No	
015	0089_MW255	HDPE (no PTFE)	20 mL	00350821008287	Grey	No	
015	0089_MW255	HDPE (no PTFE)	20 mL	00350821008420	Grey	No	
016	0089_MW233	Clear Plastic Bottle - Natural	125 mL	00070522171562	Green	No	
016	0089_MW233	HDPE (no PTFE)	20 mL	00350522039027	Grey	No	
016	0089_MW233	HDPE (no PTFE)	20 mL	00350522039186	Grey	No	
017	0089_MW249	Clear Plastic Bottle - Natural	125 mL	00070522189331	Green	No	
017	0089_MW249	HDPE (no PTFE)	20 mL	00350821008433	Grey	No	
017	0089_MW249	HDPE (no PTFE)	20 mL	00350821008401	Grey	No	
018	0089_MW516	Clear Plastic Bottle - Natural	125 mL	00070522171557	Green	No	

CHAIN OF CUSTODY

ALS COC#: 49549 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

018	0089_MW516	HDPE (no PTFE)	20 mL	00350821008508	Grey	No	
018	0089_MW516	HDPE (no PTFE)	20 mL	00350821008268	Grey	No	
019	0089_MW496	Clear Plastic Bottle - Natural	125 mL	00070522189251	Green	No	
019	0089_MW496	HDPE (no PTFE)	20 mL	00350821008465	Grey	No	
019	0089_MW496	HDPE (no PTFE)	20 mL	00350821008450	Grey	No	
020	0089_QC301	HDPE (no PTFE)	20 mL	00350821008329	Grey	No	
020	0089_QC301	HDPE (no PTFE)	20 mL	00350821008263	Grey	No	
021	0089_QC302	HDPE (no PTFE)	20 mL	00350821008281	Grey	No	
021	0089_QC302	HDPE (no PTFE)	20 mL	00350821008387	Grey	No	
022	0089_QC303	HDPE (no PTFE)	20 mL	00350821008480	Grey	No	
022	0089_QC303	HDPE (no PTFE)	20 mL	00350821008490	Grey	No	
023	0089_QC401	HDPE (no PTFE)	20 mL	00350621066027	Grey	No	

Total Bottle Count: ALS: 65, Non ALS: 8

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2303119**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49549	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 14-Mar-2023 10:00	Issue Date	: 15-Mar-2023
Client Requested Due Date	: 22-Mar-2023	Scheduled Reporting Date	: **22-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 25 / 25

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2303119-001	13-Mar-2023 09:09	0089_MW123_230313	✓	✓
EP2303119-002	13-Mar-2023 09:10	0089_QC101_230313	✓	✓
EP2303119-003	13-Mar-2023 09:34	0089_MW121_230313	✓	✓
EP2303119-004	13-Mar-2023 09:55	0089_MW120_230313	✓	✓
EP2303119-005	13-Mar-2023 09:56	0089_QC105_230313	✓	
EP2303119-006	13-Mar-2023 10:08	0089_MW112_230313	✓	✓
EP2303119-007	13-Mar-2023 10:24	0089_MW109_230313	✓	✓
EP2303119-008	13-Mar-2023 10:25	0089_QC107_230313	✓	
EP2303119-009	13-Mar-2023 10:41	0089_MW500_230313	✓	✓
EP2303119-010	13-Mar-2023 11:51	0089_MW196_230313	✓	✓
EP2303119-011	13-Mar-2023 12:18	0089_MW257_230313	✓	✓
EP2303119-012	13-Mar-2023 12:30	0089_MW258_230313	✓	✓
EP2303119-013	13-Mar-2023 12:45	0089_MW259_230313	✓	✓
EP2303119-014	13-Mar-2023 13:00	0089_MW256_230313	✓	✓
EP2303119-015	13-Mar-2023 13:14	0089_MW255_230313	✓	✓
EP2303119-016	13-Mar-2023 13:32	0089_MW233_230313	✓	✓
EP2303119-017	13-Mar-2023 13:45	0089_MW249_230313	✓	✓
EP2303119-018	13-Mar-2023 14:00	0089_MW516_230313	✓	✓
EP2303119-019	13-Mar-2023 14:13	0089_MW496_230313	✓	✓
EP2303119-020	13-Mar-2023 14:35	0089_QC301_230313	✓	
EP2303119-021	13-Mar-2023 14:35	0089_QC302_230313	✓	
EP2303119-022	13-Mar-2023 14:36	0089_QC303_230313	✓	
EP2303119-023	13-Mar-2023 14:25	0089_QC401_230313	✓	
EP2303119-024	13-Mar-2023 14:27	0089_QC402_230313	✓	
EP2303119-025	13-Mar-2023 14:27	0089_QC403_230313	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]

DERP LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303119**	Page	: 1 of 19
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Mar-2023 10:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2023
C-O-C number	: 49549	Issue Date	: 23-Mar-2023 17:10
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 25		
No. of samples analysed	: 25		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_230313	0089_QC101_230313	0089_MW121_230313	0089_MW120_230313	0089_QC105_230313
				Sampling date / time	13-Mar-2023 09:09	13-Mar-2023 09:10	13-Mar-2023 09:34	13-Mar-2023 09:55	13-Mar-2023 09:56
Compound	CAS Number	LOR	Unit		EP2303119-001	EP2303119-002	EP2303119-003	EP2303119-004	EP2303119-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**670**	**744**	**262**	**258**	----
Total Alkalinity as CaCO3	----	1	mg/L		**670**	**744**	**262**	**258**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**19**	**18**	**7**	**21**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**395**	**416**	**34**	**64**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**113**	**131**	**78**	**69**	----
Magnesium	7439-95-4	1	mg/L		**67**	**73**	**13**	**20**	----
Sodium	7440-23-5	1	mg/L		**252**	**254**	**15**	**33**	----
Potassium	7440-09-7	1	mg/L		**3**	**3**	**2**	**2**	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**24.9**	**27.0**	**6.34**	**7.40**	----
ø Total Cations	----	0.01	meq/L		**22.2**	**23.7**	**5.66**	**6.58**	----
ø Ionic Balance	----	0.01	%		**5.80**	**6.52**	**5.61**	**5.88**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.31**	**0.31**	**0.02**	**0.02**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.28**	**0.28**	<0.02	**0.03**	**0.02**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**2.24**	**1.85**	**0.38**	**4.24**	**4.71**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	**0.02**	**3.26**	**1.38**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.03**	**0.03**	**0.08**	**0.55**	**0.78**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.05**	**0.05**	**0.02**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.31**	**0.26**	**0.07**	**0.10**	**0.10**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.03**	**0.02**	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_230313	0089_QC101_230313	0089_MW121_230313	0089_MW120_230313	0089_QC105_230313
				Sampling date / time	13-Mar-2023 09:09	13-Mar-2023 09:10	13-Mar-2023 09:34	13-Mar-2023 09:55	13-Mar-2023 09:56
Compound	CAS Number	LOR	Unit		EP2303119-001	EP2303119-002	EP2303119-003	EP2303119-004	EP2303119-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.03**	**1.47**	**0.69**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_230313	0089_QC101_230313	0089_MW121_230313	0089_MW120_230313	0089_QC105_230313
				Sampling date / time	13-Mar-2023 09:09	13-Mar-2023 09:10	13-Mar-2023 09:34	13-Mar-2023 09:55	13-Mar-2023 09:56
Compound	CAS Number	LOR	Unit		EP2303119-001	EP2303119-002	EP2303119-003	EP2303119-004	EP2303119-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**3.25**	**2.80**	**0.62**	**9.67**	**7.68**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**2.27**	**1.88**	**0.46**	**4.79**	**5.49**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**2.97**	**2.52**	**0.60**	**6.38**	**6.28**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**86.2**	**99.0**	**100**	**96.3**	**90.3**
13C8-PFOA	----	0.02	%		**101**	**99.7**	**99.1**	**102**	**104**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW112_230313	0089_MW109_230313	0089_QC107_230313	0089_MW500_230313	0089_MW196_230313
				Sampling date / time	13-Mar-2023 10:08	13-Mar-2023 10:24	13-Mar-2023 10:25	13-Mar-2023 10:41	13-Mar-2023 11:51
					EP2303119-006	EP2303119-007	EP2303119-008	EP2303119-009	EP2303119-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**233**	**479**	----	**386**	**219**
Total Alkalinity as CaCO3	----	1	mg/L		**233**	**479**	----	**386**	**219**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**15**	**25**	----	**51**	**20**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**31**	**214**	----	**65**	**36**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**72**	**101**	----	**128**	**59**
Magnesium	7439-95-4	1	mg/L		**9**	**41**	----	**16**	**19**
Sodium	7440-23-5	1	mg/L		**20**	**124**	----	**25**	**23**
Potassium	7440-09-7	1	mg/L		<1	<1	----	**2**	**2**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**5.84**	**16.1**	----	**10.6**	**5.81**
ø Total Cations	----	0.01	meq/L		**5.20**	**13.8**	----	**8.84**	**5.56**
ø Ionic Balance	----	0.01	%		**5.78**	**7.75**	----	**9.07**	**2.18**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.06**	**0.14**	**0.14**	**0.43**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.16**	**0.22**	**0.20**	**0.70**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**5.94**	**1.66**	**1.34**	**12.0**	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**2.62**	**0.04**	**0.04**	**4.93**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**15.8**	**0.44**	**0.42**	**26.1**	**0.04**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.1**	**0.1**	**0.1**	**0.3**	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.22**	**0.03**	**0.02**	**0.49**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**1.00**	**0.27**	**0.24**	**2.54**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.42**	**0.02**	<0.02	**0.42**	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_230313	0089_MW109_230313	0089_QC107_230313	0089_MW500_230313	0089_MW196_230313
				Sampling date / time	13-Mar-2023 10:08	13-Mar-2023 10:24	13-Mar-2023 10:25	13-Mar-2023 10:41	13-Mar-2023 11:51
Compound	CAS Number	LOR	Unit		EP2303119-006	EP2303119-007	EP2303119-008	EP2303119-009	EP2303119-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.72**	**0.04**	**0.04**	**2.12**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.03**	<0.02	<0.02	**0.02**	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		**0.38**	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.13**	<0.05	<0.05	**0.11**	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_230313	0089_MW109_230313	0089_QC107_230313	0089_MW500_230313	0089_MW196_230313
				Sampling date / time	13-Mar-2023 10:08	13-Mar-2023 10:24	13-Mar-2023 10:25	13-Mar-2023 10:41	13-Mar-2023 11:51
Compound	CAS Number	LOR	Unit		EP2303119-006	EP2303119-007	EP2303119-008	EP2303119-009	EP2303119-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**28.6**	**2.96**	**2.54**	**50.2**	**0.04**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**21.7**	**2.10**	**1.76**	**38.1**	**0.04**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**25.4**	**2.70**	**2.30**	**44.5**	**0.04**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**83.2**	**93.5**	**93.4**	**81.5**	**96.0**
13C8-PFOA	----	0.02	%		**94.8**	**103**	**101**	**100**	**98.4**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW257_230313	0089_MW258_230313	0089_MW259_230313	0089_MW256_230313	0089_MW255_230313
				Sampling date / time	13-Mar-2023 12:18	13-Mar-2023 12:30	13-Mar-2023 12:45	13-Mar-2023 13:00	13-Mar-2023 13:14
					EP2303119-011	EP2303119-012	EP2303119-013	EP2303119-014	EP2303119-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**222**	**397**	**234**	**506**	**262**
Total Alkalinity as CaCO3	----	1	mg/L		**222**	**397**	**234**	**506**	**262**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**17**	**100**	**10**	**61**	**51**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**37**	**156**	**14**	**299**	**66**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**70**	**123**	**67**	**102**	**85**
Magnesium	7439-95-4	1	mg/L		**10**	**32**	**9**	**49**	**13**
Sodium	7440-23-5	1	mg/L		**23**	**85**	**12**	**172**	**46**
Potassium	7440-09-7	1	mg/L		**4**	**19**	<1	**3**	**4**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**5.83**	**14.4**	**5.28**	**19.8**	**8.16**
ø Total Cations	----	0.01	meq/L		**5.42**	**13.0**	**4.61**	**16.7**	**7.41**
ø Ionic Balance	----	0.01	%		**3.68**	**5.33**	**6.80**	**8.58**	**4.78**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**5.41**	<0.02	**1.51**	**0.44**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**3.78**	<0.02	**0.93**	**0.32**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.10**	**7.56**	**0.03**	**6.48**	**5.23**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.50**	<0.02	**0.18**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.04**	**4.65**	**0.12**	**5.19**	**0.34**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**1.5**	<0.1	**0.6**	**0.1**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.15**	**2.82**	**0.14**	**0.86**	**0.21**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.12**	**4.09**	**0.11**	**3.40**	**1.08**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.71**	<0.02	**0.27**	**0.12**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW257_230313	0089_MW258_230313	0089_MW259_230313	0089_MW256_230313	0089_MW255_230313
				Sampling date / time	13-Mar-2023 12:18	13-Mar-2023 12:30	13-Mar-2023 12:45	13-Mar-2023 13:00	13-Mar-2023 13:14
Compound	CAS Number	LOR	Unit		EP2303119-011	EP2303119-012	EP2303119-013	EP2303119-014	EP2303119-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.04**	**0.50**	<0.01	**0.36**	**0.02**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	**0.05**	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	**0.22**	<0.05	**0.15**	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW257_230313	0089_MW258_230313	0089_MW259_230313	0089_MW256_230313	0089_MW255_230313
				Sampling date / time	13-Mar-2023 12:18	13-Mar-2023 12:30	13-Mar-2023 12:45	13-Mar-2023 13:00	13-Mar-2023 13:14
Compound	CAS Number	LOR	Unit		EP2303119-011	EP2303119-012	EP2303119-013	EP2303119-014	EP2303119-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**1.45**	**31.7**	**0.40**	**20.0**	**7.86**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.14**	**12.2**	**0.15**	**11.7**	**5.57**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.45**	**27.5**	**0.40**	**18.8**	**7.54**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.7**	**95.1**	**93.5**	**89.7**	**103**
13C8-PFOA	----	0.02	%		**103**	**102**	**99.7**	**101**	**98.9**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_230313	0089_MW249_230313	0089_MW516_230313	0089_MW496_230313	----
				Sampling date / time	13-Mar-2023 13:32	13-Mar-2023 13:45	13-Mar-2023 14:00	13-Mar-2023 14:13	----
Compound	CAS Number	LOR	Unit		EP2303119-016	EP2303119-017	EP2303119-018	EP2303119-019	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		118	436	454	391	----
Total Alkalinity as CaCO3	----	1	mg/L		118	436	454	391	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		5	68	19	94	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		33	151	62	256	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		45	88	88	60	----
Magnesium	7439-95-4	1	mg/L		6	41	35	33	----
Sodium	7440-23-5	1	mg/L		12	102	53	187	----
Potassium	7440-09-7	1	mg/L		2	8	8	14	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		3.39	14.4	11.2	17.0	----
ø Total Cations	----	0.01	meq/L		3.31	12.4	9.78	14.2	----
ø Ionic Balance	----	0.01	%		1.20	7.39	6.83	8.94	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	0.05	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	0.02	0.07	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.03	0.23	0.52	1.20	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	0.07	0.11	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.09	0.05	5.40	6.29	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	0.02	0.06	0.16	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	0.03	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_230313	0089_MW249_230313	0089_MW516_230313	0089_MW496_230313	----
				Sampling date / time	13-Mar-2023 13:32	13-Mar-2023 13:45	13-Mar-2023 14:00	13-Mar-2023 14:13	----
Compound	CAS Number	LOR	Unit		EP2303119-016	EP2303119-017	EP2303119-018	EP2303119-019	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.05**	**0.09**	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_230313	0089_MW249_230313	0089_MW516_230313	0089_MW496_230313	----
				Sampling date / time	13-Mar-2023 13:32	13-Mar-2023 13:45	13-Mar-2023 14:00	13-Mar-2023 14:13	----
Compound	CAS Number	LOR	Unit		EP2303119-016	EP2303119-017	EP2303119-018	EP2303119-019	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.12**	**0.30**	**6.12**	**8.00**	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.12**	**0.28**	**5.92**	**7.49**	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.12**	**0.30**	**6.03**	**7.82**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**91.8**	**104**	**96.0**	----
13C8-PFOA	----	0.02	%		**105**	**99.1**	**108**	**96.8**	----

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	0089_QC301_230313	0089_QC303_230313	----	----	----
				Sampling date / time	13-Mar-2023 14:35	13-Mar-2023 14:36	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2303119-020**	**EP2303119-022**	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_230313	0089_QC303_230313	----	----	----
				Sampling date / time	13-Mar-2023 14:35	13-Mar-2023 14:36	----	----	----
Compound	CAS Number	LOR	Unit		EP2303119-020	EP2303119-022	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**121**	----	----	----
13C8-PFOA	----	0.02	%		**105**	**106**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC302_230313	0089_QC401_230313	0089_QC402_230313	0089_QC403_230313	----
				Sampling date / time	13-Mar-2023 14:35	13-Mar-2023 14:25	13-Mar-2023 14:27	13-Mar-2023 14:27	----
Compound	CAS Number	LOR	Unit		EP2303119-021	EP2303119-023	EP2303119-024	EP2303119-025	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC302_230313	0089_QC401_230313	0089_QC402_230313	0089_QC403_230313	----
				Sampling date / time	13-Mar-2023 14:35	13-Mar-2023 14:25	13-Mar-2023 14:27	13-Mar-2023 14:27	----
Compound	CAS Number	LOR	Unit		EP2303119-021	EP2303119-023	EP2303119-024	EP2303119-025	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**122**	**121**	**112**	**119**	----
13C8-PFOA	----	0.02	%		**107**	**110**	**106**	**114**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303119**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2023
C-O-C number	: 49549	Issue Date	: 23-Mar-2023
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 25		
No. of samples analysed	: 25		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4940652)									
EP2303119-010	0089_MW196_230313	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	219	217	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	219	217	0.6	0% - 20%
EP2303091-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	366	362	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	366	362	0.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4931951)									
EP2303119-001	0089_MW123_230313	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	19	19	0.0	0% - 50%
EP2303119-013	0089_MW259_230313	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	10	10	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4931952)									
EP2303119-001	0089_MW123_230313	ED045G: Chloride	16887-00-6	1	mg/L	395	399	1.0	0% - 20%
EP2303119-013	0089_MW259_230313	ED045G: Chloride	16887-00-6	1	mg/L	14	14	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 4931684)									
EP2303119-001	0089_MW123_230313	ED093F: Calcium	7440-70-2	1	mg/L	113	118	3.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	67	68	2.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	252	247	1.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EP2303119-013	0089_MW259_230313	ED093F: Calcium	7440-70-2	1	mg/L	67	68	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	9	9	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	12	12	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4933595)									
EP2303119-003	0089_MW121_230313	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.38	0.36	6.3	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.08	0.09	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2303119-012	0089_MW258_230313	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	7.56	7.36	2.6	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	4.65	3.89	17.9	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	5.41	5.49	1.5	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	3.78	3.80	0.5	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.50	0.50	0.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4933595)									
EP2303119-003	0089_MW121_230313	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.02	0.03	36.1	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.07	0.09	31.5	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2303119-012	0089_MW258_230313	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.50	0.55	10.2	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	2.82	2.79	1.0	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	4.09	3.96	3.3	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.71	0.72	1.6	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.5	1.5	0.0	0% - 50%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4933595)									
EP2303119-003	0089_MW121_230313	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4933595) - continued									
EP2303119-003	0089_MW121_230313	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303119-012	0089_MW258_230313	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4933595)									
EP2303119-003	0089_MW121_230313	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303119-012	0089_MW258_230313	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.22	0.22	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4933595)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4933595) - continued									
EP2303119-003	0089_MW121_230313	EP231X: Sum of PFAS	----	0.01	µg/L	0.62	0.64	3.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.46	0.45	2.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.60	0.62	3.3	0% - 20%
EP2303119-012	0089_MW258_230313	EP231X: Sum of PFAS	----	0.01	µg/L	31.7	30.8	3.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	12.2	11.2	8.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	27.5	26.5	3.6	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4940652)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	113	87.8	118
				<1	200 mg/L	108	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4931951)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	89.9	112
				<1	500 mg/L	98.4	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4931952)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	88.6	113
				<1	1000 mg/L	102	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4931684)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.8	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.3	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4933595)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	97.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	92.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	106	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.9	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	105	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4933596)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	100	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	103	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	91.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	95.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	101	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	80.9	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4933595)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	99.8	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4933595) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	99.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	121	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	99.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	99.6	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4933596)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	93.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	94.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	98.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	98.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	96.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	87.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	99.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4933595)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	97.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	100	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	96.2	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	102	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4933596)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	92.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	91.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.6	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.4	68.3	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4933596) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	94.4	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	102	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	93.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4933595)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	100	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	105	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	118	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4933596)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	100	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	109	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	117	64.2	133
EP231P: PFAS Sums (QCLot: 4933595)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 4933596)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4931951)							
EP2303119-001	0089_MW123_230313	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	109	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4931952)							
EP2303119-001	0089_MW123_230313	ED045G: Chloride	16887-00-6	1000 mg/L	94.2	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4933595)							
EP2303119-009	0089_MW500_230313	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	104	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	# Not Determined	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	# Not Determined	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	117	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4933595)							
EP2303119-009	0089_MW500_230313	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	91.3	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	110	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	117	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	# Not Determined	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	85.7	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.0	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	92.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	88.8	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	91.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	93.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4933595)							
EP2303119-009	0089_MW500_230313	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	94.3	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	83.2	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	84.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	95.1	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	87.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	101	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	76.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4933595)							
EP2303119-009	0089_MW500_230313	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	100.0	63.0	143

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4933595) - continued							
EP2303119-009	0089_MW500_230313	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	93.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	110	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	121	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303119**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Mar-2023
Site	: Stirling GW - MB	Issue Date	: 23-Mar-2023
Sampler	: [redacted]	No. of samples received	: 25
Order number	: pfas-omp/Stirling	No. of samples analysed	: 25

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2303119--009	0089_MW500_230313	**Perfluoropentane sulfonic acid (PFPeS)**	2706-91-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2303119--009	0089_MW500_230313	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2303119--009	0089_MW500_230313	**Perfluoroheptane sulfonic acid (PFHpS)**	375-92-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2303119--009	0089_MW500_230313	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2303119--009	0089_MW500_230313	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2303119--009	0089_MW500_230313	**Perfluorooctanoic acid (PFOA)**	335-67-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	25	8.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	25	4.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
Container / *Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW123_230313, 0089_QC101_230313, 0089_MW121_230313, 0089_MW120_230313, 0089_MW112_230313, 0089_MW109_230313, 0089_MW500_230313, 0089_MW196_230313, 0089_MW257_230313, 0089_MW258_230313, 0089_MW259_230313, 0089_MW256_230313, 0089_MW255_230313, 0089_MW233_230313, 0089_MW249_230313, 0089_MW516_230313, 0089_MW496_230313	**13-Mar-2023**	**----**	----	----	**21-Mar-2023**	27-Mar-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW123_230313, 0089_QC101_230313, 0089_MW121_230313, 0089_MW120_230313, 0089_MW112_230313, 0089_MW109_230313, 0089_MW500_230313, 0089_MW196_230313, 0089_MW257_230313, 0089_MW258_230313, 0089_MW259_230313, 0089_MW256_230313, 0089_MW255_230313, 0089_MW233_230313, 0089_MW249_230313, 0089_MW516_230313, 0089_MW496_230313	**13-Mar-2023**	**----**	----	----	**22-Mar-2023**	10-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW123_230313, 0089_QC101_230313, 0089_MW121_230313, 0089_MW120_230313, 0089_MW112_230313, 0089_MW109_230313, 0089_MW500_230313, 0089_MW196_230313, 0089_MW257_230313, 0089_MW258_230313, 0089_MW259_230313, 0089_MW256_230313, 0089_MW255_230313, 0089_MW233_230313, 0089_MW249_230313, 0089_MW516_230313, 0089_MW496_230313	**13-Mar-2023**	**----**	----	----	**22-Mar-2023**	10-Apr-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW123_230313, 0089_QC101_230313, 0089_MW121_230313, 0089_MW120_230313, 0089_MW112_230313, 0089_MW109_230313, 0089_MW500_230313, 0089_MW196_230313, 0089_MW257_230313, 0089_MW258_230313, 0089_MW259_230313, 0089_MW256_230313, 0089_MW255_230313, 0089_MW233_230313, 0089_MW249_230313, 0089_MW516_230313, 0089_MW496_230313	**13-Mar-2023**	**----**	----	----	**17-Mar-2023**	20-Mar-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW123_230313, 0089_QC101_230313, 0089_MW121_230313, 0089_MW120_230313, 0089_QC105_230313, 0089_MW112_230313, 0089_MW109_230313, 0089_QC107_230313, 0089_MW500_230313, 0089_MW196_230313, 0089_MW257_230313, 0089_MW258_230313, 0089_MW259_230313, 0089_MW256_230313, 0089_MW255_230313, 0089_MW233_230313, 0089_MW249_230313, 0089_MW516_230313, 0089_MW496_230313, 0089_QC301_230313, 0089_QC302_230313, 0089_QC303_230313, 0089_QC401_230313, 0089_QC402_230313, 0089_QC403_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW123_230313, 0089_QC101_230313, 0089_MW121_230313, 0089_MW120_230313, 0089_QC105_230313, 0089_MW112_230313, 0089_MW109_230313, 0089_QC107_230313, 0089_MW500_230313, 0089_MW196_230313, 0089_MW257_230313, 0089_MW258_230313, 0089_MW259_230313, 0089_MW256_230313, 0089_MW255_230313, 0089_MW233_230313, 0089_MW249_230313, 0089_MW516_230313, 0089_MW496_230313, 0089_QC301_230313, 0089_QC302_230313, 0089_QC303_230313, 0089_QC401_230313, 0089_QC402_230313, 0089_QC403_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW123_230313, 0089_QC101_230313, 0089_MW121_230313, 0089_MW120_230313, 0089_QC105_230313, 0089_MW112_230313, 0089_MW109_230313, 0089_QC107_230313, 0089_MW500_230313, 0089_MW196_230313, 0089_MW257_230313, 0089_MW258_230313, 0089_MW259_230313, 0089_MW256_230313, 0089_MW255_230313, 0089_MW233_230313, 0089_MW249_230313, 0089_MW516_230313, 0089_MW496_230313, 0089_QC301_230313, 0089_QC302_230313, 0089_QC303_230313, 0089_QC401_230313, 0089_QC402_230313, 0089_QC403_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW123_230313, 0089_QC101_230313, 0089_MW121_230313, 0089_MW120_230313, 0089_QC105_230313, 0089_MW112_230313, 0089_MW109_230313, 0089_QC107_230313, 0089_MW500_230313, 0089_MW196_230313, 0089_MW257_230313, 0089_MW258_230313, 0089_MW259_230313, 0089_MW256_230313, 0089_MW255_230313, 0089_MW233_230313, 0089_MW249_230313, 0089_MW516_230313, 0089_MW496_230313, 0089_QC301_230313, 0089_QC302_230313, 0089_QC303_230313, 0089_QC401_230313, 0089_QC402_230313, 0089_QC403_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW123_230313, 0089_QC101_230313, 0089_MW121_230313, 0089_MW120_230313, 0089_QC105_230313, 0089_MW112_230313, 0089_MW109_230313, 0089_QC107_230313, 0089_MW500_230313, 0089_MW196_230313, 0089_MW257_230313, 0089_MW258_230313, 0089_MW259_230313, 0089_MW256_230313, 0089_MW255_230313, 0089_MW233_230313, 0089_MW249_230313, 0089_MW516_230313, 0089_MW496_230313, 0089_QC301_230313, 0089_QC302_230313, 0089_QC303_230313, 0089_QC401_230313, 0089_QC402_230313, 0089_QC403_230313	**13-Mar-2023**	**20-Mar-2023**	09-Sep-2023	✓	**22-Mar-2023**	09-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	25	**8.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	25	**4.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2303175

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Department of Defence **Project Manager:** [redacted]

Phone: ( )

ALS Compass COC Reference: [redacted] **# Samples:** 2 Eskis **Sampler:** [redacted]

Phone: ( )

49639; 49660; 49630; 49628; 49550; 49551

Turnaround Requirements: Standard ____ Urgent ____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 14/3/23 ~3:00pm.	Date / Time: 15/3 1050	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) COC#: 49551 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW370		14/03/2023 09:03 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
002	0089_PW369		14/03/2023 09:05 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW345		14/03/2023 09:07 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW367		14/03/2023 09:08 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_SW309		14/03/2023 12:59 PM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
006	0089_SW310		14/03/2023 01:01 PM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
007	0089_SW311		14/03/2023 01:03 PM	WATER	ALS: 3 Non ALS: 0	No	X		
008	0089_PW306		14/03/2023 01:36 PM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_PW314		14/03/2023 01:37 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 49551 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_PW315		14/03/2023 01:38 PM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_PW316		14/03/2023 01:39 PM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_PW307		14/03/2023 01:40 PM	WATER	ALS: 3 Non ALS: 0	No	X		
013	0089_PW308		14/03/2023 01:41 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 49551 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW370	Clear Plastic Bottle - Natural	125 mL	00070522171469	Green	No	
001	0089_SW370	HDPE (no PTFE)	20 mL	00350621016525	Grey	No	
001	0089_SW370	HDPE (no PTFE)	20 mL	00350522039155	Grey	No	
001	0089_SW370	HDPE (no PTFE)	20 mL	00350621016722	Grey	No	
001	0089_SW370	HDPE (no PTFE)	20 mL	00350522039218	Grey	No	
002	0089_PW369	Clear Plastic Bottle - Natural	125 mL	00070522171588	Green	No	
002	0089_PW369	HDPE (no PTFE)	20 mL	00350821008523	Grey	No	
002	0089_PW369	HDPE (no PTFE)	20 mL	00350821008267	Grey	No	
003	0089_PW345	Clear Plastic Bottle - Natural	125 mL	00070522189252	Green	No	
003	0089_PW345	HDPE (no PTFE)	20 mL	00350522039177	Grey	No	
003	0089_PW345	HDPE (no PTFE)	20 mL	00350522039204	Grey	No	
004	0089_PW367	Clear Plastic Bottle - Natural	125 mL	00070522171522	Green	No	
004	0089_PW367	HDPE (no PTFE)	20 mL	00350522039241	Grey	No	
004	0089_PW367	HDPE (no PTFE)	20 mL	00350522039257	Grey	No	
005	0089_SW309	HDPE (no PTFE)	20 mL	00350821008328	Grey	No	
005	0089_SW309	HDPE (no PTFE)	20 mL	00350821008496	Grey	No	
005	0089_SW309	HDPE (no PTFE)	20 mL	00350522039236	Grey	No	
005	0089_SW309	HDPE (no PTFE)	20 mL	00350522039184	Grey	No	
005	0089_SW309	Clear Plastic Bottle - Natural	125 mL	00070522171454	Green	No	
006	0089_SW310	HDPE (no PTFE)	20 mL	00350821008322	Grey	No	
006	0089_SW310	HDPE (no PTFE)	20 mL	00350821008439	Grey	No	
006	0089_SW310	HDPE (no PTFE)	20 mL	00350821008435	Grey	No	
006	0089_SW310	HDPE (no PTFE)	20 mL	00350821008358	Grey	No	
006	0089_SW310	Clear Plastic Bottle - Natural	125 mL	00070522189274	Green	No	
007	0089_SW311	Clear Plastic Bottle - Natural	125 mL	00070522171573	Green	No	
007	0089_SW311	HDPE (no PTFE)	20 mL	00350522039048	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 49551 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

007	0089_SW311	HDPE (no PTFE)	20 mL	00350522039207	Grey	No	
008	0089_PW306	Clear Plastic Bottle - Natural	125 mL	00070522189343	Green	No	
008	0089_PW306	HDPE (no PTFE)	20 mL	00350821008524	Grey	No	
008	0089_PW306	HDPE (no PTFE)	20 mL	00350821008389	Grey	No	
009	0089_PW314	Clear Plastic Bottle - Natural	125 mL	00070522171525	Green	No	
009	0089_PW314	HDPE (no PTFE)	20 mL	00350522039217	Grey	No	
009	0089_PW314	HDPE (no PTFE)	20 mL	00350522039096	Grey	No	
010	0089_PW315	Clear Plastic Bottle - Natural	125 mL	00070522171503	Green	No	
010	0089_PW315	HDPE (no PTFE)	20 mL	00350821008541	Grey	No	
010	0089_PW315	HDPE (no PTFE)	20 mL	00350821008339	Grey	No	
011	0089_PW316	Clear Plastic Bottle - Natural	125 mL	00070522189203	Green	No	
011	0089_PW316	HDPE (no PTFE)	20 mL	00350821008298	Grey	No	
011	0089_PW316	HDPE (no PTFE)	20 mL	00350821008295	Grey	No	
012	0089_PW307	Clear Plastic Bottle - Natural	125 mL	00070522171582	Green	No	
012	0089_PW307	HDPE (no PTFE)	20 mL	00350522039008	Grey	No	
012	0089_PW307	HDPE (no PTFE)	20 mL	00350522039138	Grey	No	
013	0089_PW308	Clear Plastic Bottle - Natural	125 mL	00070522189218	Green	No	
013	0089_PW308	HDPE (no PTFE)	20 mL	00350522039119	Grey	No	
013	0089_PW308	HDPE (no PTFE)	20 mL	00350522039209	Grey	No	

Total Bottle Count: ALS: 45, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2303175**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49551	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2023 10:50	Issue Date	: 16-Mar-2023
Client Requested Due Date	: 24-Mar-2023	Scheduled Reporting Date	: **24-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 13 / 13

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2303175-001	14-Mar-2023 09:03	0089_SW370_230314	✓	✓
EP2303175-002	14-Mar-2023 09:05	0089_PW369_230314	✓	✓
EP2303175-003	14-Mar-2023 09:07	0089_PW345_230314	✓	✓
EP2303175-004	14-Mar-2023 09:08	0089_PW367_230314	✓	✓
EP2303175-005	14-Mar-2023 12:59	0089_SW309_230314	✓	✓
EP2303175-006	14-Mar-2023 13:01	0089_SW310_230314	✓	✓
EP2303175-007	14-Mar-2023 13:03	0089_SW311_230314	✓	✓
EP2303175-008	14-Mar-2023 13:36	0089_PW306_230314	✓	✓
EP2303175-009	14-Mar-2023 13:37	0089_PW314_230314	✓	✓
EP2303175-010	14-Mar-2023 13:38	0089_PW315_230314	✓	✓
EP2303175-011	14-Mar-2023 13:39	0089_PW316_230314	✓	✓
EP2303175-012	14-Mar-2023 13:40	0089_PW307_230314	✓	✓
EP2303175-013	14-Mar-2023 13:41	0089_PW308_230314	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303175**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023 10:50
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Mar-2023
C-O-C number	: 49551	Issue Date	: 24-Mar-2023 16:37
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 13		
No. of samples analysed	: 13		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW370_230314	0089_PW369_230314	0089_PW345_230314	0089_PW367_230314	0089_SW309_230314
				Sampling date / time	14-Mar-2023 09:03	14-Mar-2023 09:05	14-Mar-2023 09:07	14-Mar-2023 09:08	14-Mar-2023 12:59
Compound	CAS Number	LOR	Unit		EP2303175-001	EP2303175-002	EP2303175-003	EP2303175-004	EP2303175-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**145**	**204**	**191**	**219**	**121**
Total Alkalinity as CaCO3	----	1	mg/L		**145**	**204**	**191**	**219**	**121**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2610**	**3550**	**3220**	**2870**	**2750**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19900**	**24200**	**22300**	**22000**	**20100**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**468**	**586**	**528**	**456**	**446**
Magnesium	7439-95-4	1	mg/L		**1460**	**1870**	**1670**	**1490**	**1430**
Sodium	7440-23-5	1	mg/L		**11700**	**14900**	**13500**	**12000**	**11500**
Potassium	7440-09-7	1	mg/L		**556**	**714**	**645**	**574**	**545**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**618**	**761**	**700**	**685**	**627**
ø Total Cations	----	0.01	meq/L		**667**	**850**	**768**	**682**	**654**
ø Ionic Balance	----	0.01	%		**3.74**	**5.52**	**4.61**	**0.20**	**2.14**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.03**	**0.07**	**0.04**	**0.02**	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW370_230314	0089_PW369_230314	0089_PW345_230314	0089_PW367_230314	0089_SW309_230314
				Sampling date / time	14-Mar-2023 09:03	14-Mar-2023 09:05	14-Mar-2023 09:07	14-Mar-2023 09:08	14-Mar-2023 12:59
Compound	CAS Number	LOR	Unit		EP2303175-001	EP2303175-002	EP2303175-003	EP2303175-004	EP2303175-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW370_230314	0089_PW369_230314	0089_PW345_230314	0089_PW367_230314	0089_SW309_230314
				Sampling date / time	14-Mar-2023 09:03	14-Mar-2023 09:05	14-Mar-2023 09:07	14-Mar-2023 09:08	14-Mar-2023 12:59
Compound	CAS Number	LOR	Unit		EP2303175-001	EP2303175-002	EP2303175-003	EP2303175-004	EP2303175-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.03**	**0.07**	**0.04**	**0.02**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.03**	**0.07**	**0.04**	**0.02**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	**0.07**	**0.04**	**0.02**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**116**	**115**	**100**	**116**	**106**
13C8-PFOA	----	0.02	%		**98.4**	**101**	**87.7**	**95.9**	**94.2**

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SW310_230314	0089_SW311_230314	0089_PW306_230314	0089_PW314_230314	0089_PW315_230314
				Sampling date / time	14-Mar-2023 13:01	14-Mar-2023 13:03	14-Mar-2023 13:36	14-Mar-2023 13:37	14-Mar-2023 13:38
					EP2303175-006	EP2303175-007	EP2303175-008	EP2303175-009	EP2303175-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**166**	**122**	**158**	**146**	**182**
Total Alkalinity as CaCO3	----	1	mg/L		**166**	**122**	**158**	**146**	**182**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2810**	**2780**	**2820**	**2870**	**2820**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19900**	**20200**	**19700**	**19900**	**20400**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**452**	**442**	**472**	**482**	**453**
Magnesium	7439-95-4	1	mg/L		**1440**	**1420**	**1480**	**1470**	**1420**
Sodium	7440-23-5	1	mg/L		**11600**	**11400**	**11900**	**11800**	**11500**
Potassium	7440-09-7	1	mg/L		**557**	**542**	**570**	**579**	**548**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**623**	**630**	**618**	**624**	**638**
ø Total Cations	----	0.01	meq/L		**660**	**649**	**678**	**673**	**654**
ø Ionic Balance	----	0.01	%		**2.86**	**1.45**	**4.63**	**3.78**	**1.23**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW310_230314	0089_SW311_230314	0089_PW306_230314	0089_PW314_230314	0089_PW315_230314
				Sampling date / time	14-Mar-2023 13:01	14-Mar-2023 13:03	14-Mar-2023 13:36	14-Mar-2023 13:37	14-Mar-2023 13:38
Compound	CAS Number	LOR	Unit		EP2303175-006	EP2303175-007	EP2303175-008	EP2303175-009	EP2303175-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_SW310_230314	0089_SW311_230314	0089_PW306_230314	0089_PW314_230314	0089_PW315_230314
			Sampling date / time	14-Mar-2023 13:01	14-Mar-2023 13:03	14-Mar-2023 13:36	14-Mar-2023 13:37	14-Mar-2023 13:38
Compound	CAS Number	LOR	Unit	EP2303175-006	EP2303175-007	EP2303175-008	EP2303175-009	EP2303175-010
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**105**	**116**	**114**	**119**	**103**
13C8-PFOA	----	0.02	%	**90.2**	**98.0**	**93.4**	**92.0**	**93.1**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW316_230314	0089_PW307_230314	0089_PW308_230314	----	----
				Sampling date / time	14-Mar-2023 13:39	14-Mar-2023 13:40	14-Mar-2023 13:41	----	----
Compound	CAS Number	LOR	Unit		EP2303175-011	EP2303175-012	EP2303175-013	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		124	124	136	----	----
Total Alkalinity as CaCO3	----	1	mg/L		124	124	136	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2780	2780	2710	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20400	20000	19900	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		465	469	470	----	----
Magnesium	7439-95-4	1	mg/L		1490	1500	1490	----	----
Sodium	7440-23-5	1	mg/L		12000	12000	12000	----	----
Potassium	7440-09-7	1	mg/L		572	574	575	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		636	624	620	----	----
ø Total Cations	----	0.01	meq/L		682	684	683	----	----
ø Ionic Balance	----	0.01	%		3.54	4.51	4.78	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW316_230314	0089_PW307_230314	0089_PW308_230314	----	----
				Sampling date / time	14-Mar-2023 13:39	14-Mar-2023 13:40	14-Mar-2023 13:41	----	----
Compound	CAS Number	LOR	Unit		EP2303175-011	EP2303175-012	EP2303175-013	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW316_230314	0089_PW307_230314	0089_PW308_230314	----	----
			Sampling date / time	14-Mar-2023 13:39	14-Mar-2023 13:40	14-Mar-2023 13:41	----	----
Compound	CAS Number	LOR	Unit	EP2303175-011	EP2303175-012	EP2303175-013	--------	--------
				Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	<0.01	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**110**	**113**	**116**	----	----
13C8-PFOA	----	0.02	%	**92.7**	**88.8**	**98.1**	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303175**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Mar-2023
C-O-C number	: 49551	Issue Date	: 24-Mar-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 13		
No. of samples analysed	: 13		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4943558)									
EP2303175-009	0089_PW314_230314	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	146	146	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	146	146	0.0	0% - 20%
EP2303125-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	359	347	3.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	359	347	3.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4934909)									
EP2303175-001	0089_SW370_230314	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2610	2770	5.7	0% - 20%
EP2303175-011	0089_PW316_230314	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2780	2790	0.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4934910)									
EP2303175-001	0089_SW370_230314	ED045G: Chloride	16887-00-6	1	mg/L	19900	20100	0.9	0% - 20%
EP2303175-011	0089_PW316_230314	ED045G: Chloride	16887-00-6	1	mg/L	20400	20200	0.7	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4934505)									
EP2303175-001	0089_SW370_230314	ED093F: Calcium	7440-70-2	1	mg/L	468	452	3.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1440	1.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	11500	1.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	556	543	2.3	0% - 20%
EP2303175-011	0089_PW316_230314	ED093F: Calcium	7440-70-2	1	mg/L	465	463	0.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1490	1480	1.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	11900	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	572	569	0.6	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4944224)									
EP2303175-001	0089_SW370_230314	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2303175-006	0089_SW310_230314	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4944224)									
EP2303175-001	0089_SW370_230314	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2303175-006	0089_SW310_230314	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4944224)									
EP2303175-001	0089_SW370_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4944224) - continued									
EP2303175-001	0089_SW370_230314	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303175-006	0089_SW310_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4944224)									
EP2303175-001	0089_SW370_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303175-006	0089_SW310_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4944224)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4944224) - continued									
EP2303175-001	0089_SW370_230314	EP231X: Sum of PFAS	----	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.03	0.03	0.0	No Limit
EP2303175-006	0089_SW310_230314	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4943558)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	101	87.8	118
				<1	200 mg/L	102	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4934909)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.8	89.9	112
				<1	500 mg/L	96.7	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4934910)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	99.2	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4934505)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	106	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.0	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4944224)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	93.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	92.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	83.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	89.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	123	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944224)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	85.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	87.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	92.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	86.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	96.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	84.4	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944224) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	93.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4944224)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	85.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	82.1	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	95.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	85.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	91.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	105	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4944224)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	94.1	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	87.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	84.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	116	64.2	133
EP231P: PFAS Sums (QCLot: 4944224)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4934909)							
EP2303175-001	0089_SW370_230314	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4934910)							
EP2303175-001	0089_SW370_230314	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4944224)							
EP2303175-005	0089_SW309_230314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	87.0	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	81.9	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	79.5	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	85.5	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	83.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	77.8	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944224)							
EP2303175-005	0089_SW309_230314	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	90.5	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	80.1	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	79.8	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	82.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	83.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	90.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	83.4	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	76.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	83.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	79.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	86.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4944224)							
EP2303175-005	0089_SW309_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	95.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	79.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	75.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	83.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	84.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	77.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4944224)							
EP2303175-005	0089_SW309_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	93.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	84.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	116	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	80.1	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303175**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Site	: Stirling SW/PW - CG	Issue Date	: 24-Mar-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 13
Order number	: pfas-omp/Stirling	No. of samples analysed	: 13

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2303175--001	0089_SW370_230314	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2303175--001	0089_SW370_230314	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW370_230314, 0089_PW369_230314, 0089_PW345_230314, 0089_PW367_230314, 0089_SW309_230314, 0089_SW310_230314, 0089_SW311_230314, 0089_PW306_230314, 0089_PW314_230314, 0089_PW315_230314, 0089_PW316_230314, 0089_PW307_230314, 0089_PW308_230314	**14-Mar-2023**	**----**	----	----	**22-Mar-2023**	28-Mar-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW370_230314, 0089_PW369_230314, 0089_PW345_230314, 0089_PW367_230314, 0089_SW309_230314, 0089_SW310_230314, 0089_SW311_230314, 0089_PW306_230314, 0089_PW314_230314, 0089_PW315_230314, 0089_PW316_230314, 0089_PW307_230314, 0089_PW308_230314	**14-Mar-2023**	**----**	----	----	**23-Mar-2023**	11-Apr-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW370_230314, 0089_PW369_230314, 0089_PW345_230314, 0089_PW367_230314, 0089_SW309_230314, 0089_SW310_230314, 0089_SW311_230314, 0089_PW306_230314, 0089_PW314_230314, 0089_PW315_230314, 0089_PW316_230314, 0089_PW307_230314, 0089_PW308_230314	**14-Mar-2023**	**----**	----	----	**23-Mar-2023**	11-Apr-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW370_230314, 0089_PW369_230314, 0089_PW345_230314, 0089_PW367_230314, 0089_SW309_230314, 0089_SW310_230314, 0089_SW311_230314, 0089_PW306_230314, 0089_PW314_230314, 0089_PW315_230314, 0089_PW316_230314, 0089_PW307_230314, 0089_PW308_230314	**14-Mar-2023**	**----**	----	----	**17-Mar-2023**	21-Mar-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW370_230314, 0089_PW369_230314, 0089_PW345_230314, 0089_PW367_230314, 0089_SW309_230314, 0089_SW310_230314, 0089_SW311_230314, 0089_PW306_230314, 0089_PW314_230314, 0089_PW315_230314, 0089_PW316_230314, 0089_PW307_230314, 0089_PW308_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW370_230314, 0089_PW369_230314, 0089_PW345_230314, 0089_PW367_230314, 0089_SW309_230314, 0089_SW310_230314, 0089_SW311_230314, 0089_PW306_230314, 0089_PW314_230314, 0089_PW315_230314, 0089_PW316_230314, 0089_PW307_230314, 0089_PW308_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW370_230314, 0089_PW369_230314, 0089_PW345_230314, 0089_PW367_230314, 0089_SW309_230314, 0089_SW310_230314, 0089_SW311_230314, 0089_PW306_230314, 0089_PW314_230314, 0089_PW315_230314, 0089_PW316_230314, 0089_PW307_230314, 0089_PW308_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW370_230314, 0089_PW369_230314, 0089_PW345_230314, 0089_PW367_230314, 0089_SW309_230314, 0089_SW310_230314, 0089_SW311_230314, 0089_PW306_230314, 0089_PW314_230314, 0089_PW315_230314, 0089_PW316_230314, 0089_PW307_230314, 0089_PW308_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW370_230314, 0089_PW369_230314, 0089_PW345_230314, 0089_PW367_230314, 0089_SW309_230314, 0089_SW310_230314, 0089_SW311_230314, 0089_PW306_230314, 0089_PW314_230314, 0089_PW315_230314, 0089_PW316_230314, 0089_PW307_230314, 0089_PW308_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2303176

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMD_23 **Client:** Department of Defence **Project Manager** [redacted]

ALS Compass COC Reference: [redacted] **# Samples:** 8 ESKIS **Phone:**

49639; 49640; 49630; 49628; 49550; 49551 **Sampler:** [redacted]

Turnaround Requirements: Standard / Urgent **Phone:** ( )

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 14/3/23 ~ 3:09 pm.	**Date / Time:** 15/3 1050	**Date / Time:**	**Date / Time:**

CHAIN OF CUSTODY

(ALS) COC#: 49553 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD369		14/03/2023 09:12 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD367		14/03/2023 09:13 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD345		14/03/2023 09:13 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD306		14/03/2023 01:42 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD314		14/03/2023 01:43 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD307		14/03/2023 01:43 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD316		14/03/2023 01:43 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
008	0089_SD308		14/03/2023 01:44 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
009	0089_SD315		14/03/2023 01:44 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2303176**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49553	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2023 10:50	Issue Date	: 16-Mar-2023
Client Requested Due Date	: 24-Mar-2023	Scheduled Reporting Date	: **24-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2303176-001	14-Mar-2023 09:12	0089_SD369_230314	✓	✓
EP2303176-002	14-Mar-2023 09:13	0089_SD367_230314	✓	✓
EP2303176-003	14-Mar-2023 09:13	0089_SD345_230314	✓	✓
EP2303176-004	14-Mar-2023 13:42	0089_SD306_230314	✓	✓
EP2303176-005	14-Mar-2023 13:43	0089_SD314_230314	✓	✓
EP2303176-006	14-Mar-2023 13:43	0089_SD307_230314	✓	✓
EP2303176-007	14-Mar-2023 13:43	0089_SD316_230314	✓	✓
EP2303176-008	14-Mar-2023 13:44	0089_SD308_230314	✓	✓
EP2303176-009	14-Mar-2023 13:44	0089_SD315_230314	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303176**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023 10:50
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49553	Issue Date	: 23-Mar-2023 17:11
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD369_230314	0089_SD367_230314	0089_SD345_230314	0089_SD306_230314	0089_SD314_230314
				Sampling date / time	14-Mar-2023 09:12	14-Mar-2023 09:13	14-Mar-2023 09:13	14-Mar-2023 13:42	14-Mar-2023 13:43
					EP2303176-001	EP2303176-002	EP2303176-003	EP2303176-004	EP2303176-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**35.0**	**26.7**	**30.8**	**14.5**	**19.2**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0003**	**0.0007**	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD369_230314	0089_SD367_230314	0089_SD345_230314	0089_SD306_230314	0089_SD314_230314
				Sampling date / time	14-Mar-2023 09:12	14-Mar-2023 09:13	14-Mar-2023 09:13	14-Mar-2023 13:42	14-Mar-2023 13:43
Compound	CAS Number	LOR	Unit		EP2303176-001	EP2303176-002	EP2303176-003	EP2303176-004	EP2303176-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0003**	**0.0007**	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0003**	**0.0007**	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0003**	**0.0007**	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**117**	**109**	**93.5**	**113**	**104**
13C8-PFOA	----	0.0002	%		**86.5**	**94.5**	**98.0**	**95.0**	**91.0**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD307_230314	0089_SD316_230314	0089_SD308_230314	0089_SD315_230314	----
			Sampling date / time	14-Mar-2023 13:43	14-Mar-2023 13:43	14-Mar-2023 13:44	14-Mar-2023 13:44	----
Compound	CAS Number	LOR	Unit	EP2303176-006	EP2303176-007	EP2303176-008	EP2303176-009	--------
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**21.8**	**21.8**	**20.9**	**22.6**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD307_230314	0089_SD316_230314	0089_SD308_230314	0089_SD315_230314	----
				Sampling date / time	14-Mar-2023 13:43	14-Mar-2023 13:43	14-Mar-2023 13:44	14-Mar-2023 13:44	----
Compound	CAS Number	LOR	Unit		EP2303176-006	EP2303176-007	EP2303176-008	EP2303176-009	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**108**	**113**	**110**	**106**	----
13C8-PFOA	----	0.0002	%		**95.0**	**90.5**	**91.5**	**93.0**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303176**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49553	Issue Date	: 23-Mar-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4943679)									
EP2303176-001	0089_SD369_230314	EA055: Moisture Content	----	0.1	%	35.0	35.5	1.3	0% - 20%
EP2303180-001	Anonymous	EA055: Moisture Content	----	0.1	%	29.2	29.9	2.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4937632)									
EP2303176-001	0089_SD369_230314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0004	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2303180-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4937632)									
EP2303176-001	0089_SD369_230314	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4937632) - continued									
EP2303176-001	0089_SD369_230314	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2303180-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4937632)									
EP2303176-001	0089_SD369_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2303180-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4937632)									
EP2303176-001	0089_SD369_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2303180-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4937632)									
EP2303176-001	0089_SD369_230314	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
EP2303180-002	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937632)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	110	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	84.3	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	96.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	90.1	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	94.6	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937632)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	99.3	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	104	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937632)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	130	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.5	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	80.6	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.1	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.9	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937632)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	107	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	122	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937632) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	95.0	54.8	124
EP231P: PFAS Sums (QCLot: 4937632)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937632)							
EP2303176-002	0089_SD367_230314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	102	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	94.9	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	82.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	98.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	91.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	89.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937632)							
EP2303176-002	0089_SD367_230314	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	98.3	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	87.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	88.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	94.3	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	94.4	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	100	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	100	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	101	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	91.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	86.3	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	101	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937632)							
EP2303176-002	0089_SD367_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	121	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	85.9	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	89.7	60.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937632) - continued							
EP2303176-002	0089_SD367_230314	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	95.4	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	116	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	110	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937632)							
EP2303176-002	0089_SD367_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	106	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	102	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	121	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	95.7	60.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303176**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Site	: Stirling SD - CG	Issue Date	: 23-Mar-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD369_230314, 0089_SD367_230314, 0089_SD345_230314, 0089_SD306_230314, 0089_SD314_230314, 0089_SD307_230314, 0089_SD316_230314, 0089_SD308_230314, 0089_SD315_230314	**14-Mar-2023**	**----**	----	----	**22-Mar-2023**	28-Mar-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD369_230314, 0089_SD367_230314, 0089_SD345_230314, 0089_SD306_230314, 0089_SD314_230314, 0089_SD307_230314, 0089_SD316_230314, 0089_SD308_230314, 0089_SD315_230314	**14-Mar-2023**	**17-Mar-2023**	10-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD369_230314, 0089_SD367_230314, 0089_SD345_230314, 0089_SD306_230314, 0089_SD314_230314, 0089_SD307_230314, 0089_SD316_230314, 0089_SD308_230314, 0089_SD315_230314	**14-Mar-2023**	**17-Mar-2023**	10-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD369_230314, 0089_SD367_230314, 0089_SD345_230314, 0089_SD306_230314, 0089_SD314_230314, 0089_SD307_230314, 0089_SD316_230314, 0089_SD308_230314, 0089_SD315_230314	**14-Mar-2023**	**17-Mar-2023**	10-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD369_230314, 0089_SD367_230314, 0089_SD345_230314, 0089_SD306_230314, 0089_SD314_230314, 0089_SD307_230314, 0089_SD316_230314, 0089_SD308_230314, 0089_SD315_230314	**14-Mar-2023**	**17-Mar-2023**	10-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD369_230314, 0089_SD367_230314, 0089_SD345_230314, 0089_SD306_230314, 0089_SD314_230314, 0089_SD307_230314, 0089_SD316_230314, 0089_SD308_230314, 0089_SD315_230314	**14-Mar-2023**	**17-Mar-2023**	10-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2303177

Telephone : -- 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089_PFASOMP_23 **Client:** Department of Defence **Project Manager:** [redacted]

Phone: ( )

ALS Compass COC Reference: **# Samples:** 2 ESKIS **Sampler:** [redacted]

Phone: ( )

49639; 49660; 49630; 49629; 49550; 49551

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 14/3/23 ~3:00pm.	Date / Time: 15/3 1050	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 49628 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW197		14/03/2023 06:59 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
002	0089_MW200		14/03/2023 09:01 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
003	0089_MW216		14/03/2023 11:17 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
004	0089_MW214		14/03/2023 11:26 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
005	0089_MW215		14/03/2023 11:41 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS
006	0089_MW225		14/03/2023 11:58 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra Lab QAQC PFAS

CUSTODY

ALS Laboratory: EP Perth

- STANTEC AUSTRALIA PTY LTD

_PFASOMP_23

V - CG

Stirling

[redacted]

[redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

E NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
MW197	Clear Plastic Bottle - Natural	125 mL	00070522189229	Green	No	
MW197	HDPE (no PTFE)	20 mL	00350621016833	Grey	No	
MW197	HDPE (no PTFE)	20 mL	00350821008309	Grey	No	
MW197	HDPE (no PTFE)	20 mL	00350821008454	Grey	No	
MW197	HDPE (no PTFE)	20 mL	00350621016677	Grey	No	
MW200	Clear Plastic Bottle - Natural	125 mL	00070522171497	Green	No	
MW200	HDPE (no PTFE)	20 mL	00350621016823	Grey	No	
MW200	HDPE (no PTFE)	20 mL	00350522039276	Grey	No	
MW200	HDPE (no PTFE)	20 mL	00350522039298	Grey	No	
MW200	HDPE (no PTFE)	20 mL	00350621016687	Grey	No	
MW216	Clear Plastic Bottle - Natural	125 mL	00070522189261	Green	No	
MW216	HDPE (no PTFE)	20 mL	00350621016729	Grey	No	
MW216	HDPE (no PTFE)	20 mL	00350821008468	Grey	No	
MW216	HDPE (no PTFE)	20 mL	00350821008301	Grey	No	
MW216	HDPE (no PTFE)	20 mL	00350621016859	Grey	No	
MW214	Clear Plastic Bottle - Natural	125 mL	00070522171577	Green	No	
MW214	HDPE (no PTFE)	20 mL	00350522039173	Grey	No	
MW214	HDPE (no PTFE)	20 mL	00350522039203	Grey	No	
MW214	HDPE (no PTFE)	20 mL	00350621016928	Grey	No	
MW214	HDPE (no PTFE)	20 mL	00350621016813	Grey	No	
MW215	Clear Plastic Bottle - Natural	125 mL	00070522189267	Green	No	
MW215	HDPE (no PTFE)	20 mL	00350821008431	Grey	No	
MW215	HDPE (no PTFE)	20 mL	00350821008299	Grey	No	
MW215	HDPE (no PTFE)	20 mL	00350621016644	Grey	No	
MW215	HDPE (no PTFE)	20 mL	00350621016905	Grey	No	
MW225	Clear Plastic Bottle - Natural	125 mL	00070522189299	Green	No	

10:17:56 PM

CHAIN OF CUSTODY

COC#: **49628** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

006	0089_MW225	HDPE (no PTFE)	20 mL	00350522039282	Grey	No	
006	0089_MW225	HDPE (no PTFE)	20 mL	00350621016702	Grey	No	
006	0089_MW225	HDPE (no PTFE)	20 mL	00350522039070	Grey	No	
006	0089_MW225	HDPE (no PTFE)	20 mL	00350621017011	Grey	No	

Total Bottle Count: ALS: 30, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2303177**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49628	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2023 10:50	Issue Date	: 16-Mar-2023
Client Requested Due Date	: 24-Mar-2023	Scheduled Reporting Date	: **24-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2303177-001	14-Mar-2023 08:59	0089_MW197_230314	✓	✓
EP2303177-002	14-Mar-2023 09:01	0089_MW200_230314	✓	✓
EP2303177-003	14-Mar-2023 11:17	0089_MW216_230314	✓	✓
EP2303177-004	14-Mar-2023 11:26	0089_MW214_230314	✓	✓
EP2303177-005	14-Mar-2023 11:41	0089_MW215_230314	✓	✓
EP2303177-006	14-Mar-2023 11:58	0089_MW225_230314	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303177**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023 10:50
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Mar-2023
C-O-C number	: 49628	Issue Date	: 24-Mar-2023 16:39
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW197_230314	0089_MW200_230314	0089_MW216_230314	0089_MW214_230314	0089_MW215_230314
				Sampling date / time	14-Mar-2023 08:59	14-Mar-2023 09:01	14-Mar-2023 11:17	14-Mar-2023 11:26	14-Mar-2023 11:41
					EP2303177-001	EP2303177-002	EP2303177-003	EP2303177-004	EP2303177-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**437**	**421**	**285**	**430**	**291**
Total Alkalinity as CaCO3	----	1	mg/L		**437**	**421**	**285**	**430**	**291**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**107**	**200**	**212**	**52**	**88**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**744**	**1940**	**957**	**2450**	**408**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**54**	**84**	**206**	**262**	**129**
Magnesium	7439-95-4	1	mg/L		**110**	**98**	**70**	**152**	**35**
Sodium	7440-23-5	1	mg/L		**410**	**1270**	**492**	**1130**	**174**
Potassium	7440-09-7	1	mg/L		**26**	**62**	**10**	**7**	**8**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**31.9**	**67.3**	**37.1**	**78.8**	**19.2**
ø Total Cations	----	0.01	meq/L		**30.2**	**69.1**	**37.7**	**74.9**	**17.1**
ø Ionic Balance	----	0.01	%		**2.73**	**1.31**	**0.79**	**2.52**	**5.70**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.20**	<0.02	**0.04**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	**0.25**	<0.02	**0.06**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	**2.12**	<0.01	**0.45**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	**0.07**	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.02**	<0.01	**0.50**	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	**4.1**	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	**15.5**	<0.02	**0.04**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**7.54**	<0.02	**0.12**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.38**	<0.02	**0.02**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW197_230314	0089_MW200_230314	0089_MW216_230314	0089_MW214_230314	0089_MW215_230314
				Sampling date / time	14-Mar-2023 08:59	14-Mar-2023 09:01	14-Mar-2023 11:17	14-Mar-2023 11:26	14-Mar-2023 11:41
Compound	CAS Number	LOR	Unit		EP2303177-001	EP2303177-002	EP2303177-003	EP2303177-004	EP2303177-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.17**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	**1.37**	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW197_230314	0089_MW200_230314	0089_MW216_230314	0089_MW214_230314	0089_MW215_230314
				Sampling date / time	14-Mar-2023 08:59	14-Mar-2023 09:01	14-Mar-2023 11:17	14-Mar-2023 11:26	14-Mar-2023 11:41
Compound	CAS Number	LOR	Unit		EP2303177-001	EP2303177-002	EP2303177-003	EP2303177-004	EP2303177-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	<0.01	**32.2**	<0.01	**0.73**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	**2.62**	<0.01	**0.45**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	<0.01	**31.9**	<0.01	**0.67**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**103**	**98.8**	**102**	**112**
13C8-PFOA	----	0.02	%		**93.9**	**86.6**	**88.3**	**90.5**	**85.7**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW225_230314	----	----	----	----
				Sampling date / time	14-Mar-2023 11:58	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2303177-006	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**352**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**352**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**62**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**493**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**111**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**42**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**218**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**5**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**22.2**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**18.6**	----	----	----	----
ø Ionic Balance	----	0.01	%		**8.88**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW225_230314	----	----	----	----
				Sampling date / time	14-Mar-2023 11:58	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2303177-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW225_230314	----	----	----	----
				Sampling date / time	14-Mar-2023 11:58	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2303177-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	----	----	----	----
13C8-PFOA	----	0.02	%		**93.9**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303177**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Mar-2023
C-O-C number	: 49628	Issue Date	: 24-Mar-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4943558)									
EP2303175-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	146	146	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	146	146	0.0	0% - 20%
EP2303125-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	359	347	3.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	359	347	3.6	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4943561)									
EP2303177-006	0089_MW225_230314	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	352	351	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	352	351	0.0	0% - 20%
EP2303179-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	127	2.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	127	2.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4934909)									
EP2303175-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2610	2770	5.7	0% - 20%
EP2303175-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2780	2790	0.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4934910)									
EP2303175-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19900	20100	0.9	0% - 20%
EP2303175-011	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	20400	20200	0.7	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4934505)									
EP2303175-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	468	452	3.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1440	1.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	11500	1.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	556	543	2.3	0% - 20%
EP2303175-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	465	463	0.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1490	1480	1.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	11900	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	572	569	0.6	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4944233)									
EP2303177-001	0089_MW197_230314	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.03	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2303178-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.19	0.20	0.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.16	0.17	8.8	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.12	0.12	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4944233)									
EP2303177-001	0089_MW197_230314	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2303178-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.23	0.23	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	4.84	4.91	1.4	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	5.00	5.12	2.4	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.18	1.17	0.0	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4944233) - continued									
EP2303178-003	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.4	1.4	0.0	0% - 50%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4944233)									
EP2303177-001	0089_MW197_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303178-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4944233)									
EP2303177-001	0089_MW197_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4944233) - continued									
EP2303178-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.91	0.85	7.5	0% - 50%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4944233)									
EP2303177-001	0089_MW197_230314	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.03	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.03	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.03	40.0	No Limit
EP2303178-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	14.0	14.2	1.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.19	0.20	5.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	13.9	14.0	1.0	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4943558)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	101	87.8	118
				<1	200 mg/L	102	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 4943561)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	104	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4934909)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.8	89.9	112
				<1	500 mg/L	96.7	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4934910)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	99.2	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4934505)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	106	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.0	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4944233)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	88.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	80.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	82.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	85.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	117	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944233)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	89.4	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944233) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	84.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	88.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	82.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	107	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4944233)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	98.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	68.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	78.7	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	97.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	88.0	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	119	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4944233)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	99.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	97.9	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	104	64.2	133
EP231P: PFAS Sums (QCLot: 4944233)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4934909)							
EP2303175-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4934910)							
EP2303175-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4944233)							
EP2303177-002	0089_MW200_230314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.9	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	86.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	84.0	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	94.1	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	97.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	92.3	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944233)							
EP2303177-002	0089_MW200_230314	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	91.2	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	82.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	86.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	86.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	89.2	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	88.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	79.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	86.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	86.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	77.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	95.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4944233)							
EP2303177-002	0089_MW200_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	87.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	84.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	74.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	93.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	91.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	98.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	88.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4944233)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4944233) - continued							
EP2303177-002	0089_MW200_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	100	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	90.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	76.4	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303177**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Site	: Stirling GW - CG	Issue Date	: 24-Mar-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2303175--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2303175--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW197_230314,	0089_MW200_230314,	**14-Mar-2023**	**----**	----	----	**22-Mar-2023**	28-Mar-2023	✓
0089_MW216_230314,	0089_MW214_230314,							
0089_MW215_230314,	0089_MW225_230314							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW197_230314,	0089_MW200_230314,	**14-Mar-2023**	**----**	----	----	**23-Mar-2023**	11-Apr-2023	✓
0089_MW216_230314,	0089_MW214_230314,							
0089_MW215_230314,	0089_MW225_230314							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW197_230314,	0089_MW200_230314,	**14-Mar-2023**	**----**	----	----	**23-Mar-2023**	11-Apr-2023	✓
0089_MW216_230314,	0089_MW214_230314,							
0089_MW215_230314,	0089_MW225_230314							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_MW197_230314,	0089_MW200_230314,	**14-Mar-2023**	**----**	----	----	**17-Mar-2023**	21-Mar-2023	✓
0089_MW216_230314,	0089_MW214_230314,							
0089_MW215_230314,	0089_MW225_230314							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW197_230314, 0089_MW200_230314, 0089_MW216_230314, 0089_MW214_230314, 0089_MW215_230314, 0089_MW225_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**24-Mar-2023**	10-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW197_230314, 0089_MW200_230314, 0089_MW216_230314, 0089_MW214_230314, 0089_MW215_230314, 0089_MW225_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**24-Mar-2023**	10-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW197_230314, 0089_MW200_230314, 0089_MW216_230314, 0089_MW214_230314, 0089_MW215_230314, 0089_MW225_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**24-Mar-2023**	10-Sep-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW197_230314, 0089_MW200_230314, 0089_MW216_230314, 0089_MW214_230314, 0089_MW215_230314, 0089_MW225_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**24-Mar-2023**	10-Sep-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW197_230314, 0089_MW200_230314, 0089_MW216_230314, 0089_MW214_230314, 0089_MW215_230314, 0089_MW225_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**24-Mar-2023**	10-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2303178

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Department of Defence **Project Manager:** [redacted]

ALS Compass COC Reference: 49639; 49640; 49630; 49628; 49550; 49551 **# Samples:** 2 ESKYS **Phone:** [redacted]

Turnaround Requirements: Standard / Urgent **Sampler:** [redacted] **Phone:** [redacted]

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 14/3/23 ~3:09pm.	Date / Time: 15/3 1050	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 49630 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW289		14/03/2023 08:48 AM	WATER	ALS: 5 Non ALS: 0	No		X		
002	0089_MW288		14/03/2023 09:29 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_MW228		14/03/2023 12:52 PM	WATER	ALS: 5 Non ALS: 0	No		X		
004	0089_MW227		14/03/2023 01:03 PM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_MW226		14/03/2023 02:13 PM	WATER	ALS: 3 Non ALS: 0	No		X		
006	0089_QC301		14/03/2023 02:56 PM	WATER	ALS: 2 Non ALS: 0	No	X			
007	0089_QC302		14/03/2023 02:49 PM	WATER	ALS: 2 Non ALS: 0	No	X			
008	0089_QC401		14/03/2023 02:50 PM	WATER	ALS: 2 Non ALS: 0	No	X			
009	0089_QC402		14/03/2023 02:51 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: 49630 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free Ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW289	Clear Plastic Bottle - Natural	125 mL	00070522189262	Green	No	
001	0089_MW289	HDPE (no PTFE)	20 mL	00350821008471	Grey	No	
001	0089_MW289	HDPE (no PTFE)	20 mL	00350621000470	Grey	No	
001	0089_MW289	HDPE (no PTFE)	20 mL	00350821008501	Grey	No	
001	0089_MW289	HDPE (no PTFE)	20 mL	00350621000549	Grey	No	
002	0089_MW288	Clear Plastic Bottle - Natural	125 mL	00070522171535	Green	No	
002	0089_MW288	HDPE (no PTFE)	20 mL	00350821008311	Grey	No	
002	0089_MW288	HDPE (no PTFE)	20 mL	00350821008330	Grey	No	
003	0089_MW228	HDPE (no PTFE)	20 mL	00350621000440	Grey	No	
003	0089_MW228	HDPE (no PTFE)	20 mL	00350621000569	Grey	No	
003	0089_MW228	HDPE (no PTFE)	20 mL	00350821008307	Grey	No	
003	0089_MW228	Clear Plastic Bottle - Natural	125 mL	00070522189201	Green	No	
003	0089_MW228	HDPE (no PTFE)	20 mL	00350821008424	Grey	No	
004	0089_MW227	HDPE (no PTFE)	20 mL	00350821008532	Grey	No	
004	0089_MW227	HDPE (no PTFE)	20 mL	00350821008292	Grey	No	
004	0089_MW227	Clear Plastic Bottle - Natural	125 mL	00070522189360	Green	No	
005	0089_MW226	Clear Plastic Bottle - Natural	125 mL	00070522189260	Green	No	
005	0089_MW226	HDPE (no PTFE)	20 mL	00350821008429	Grey	No	
005	0089_MW226	HDPE (no PTFE)	20 mL	00350821008483	Grey	No	
006	0089_QC301	HDPE (no PTFE)	20 mL	00350821008442	Grey	No	
006	0089_QC301	HDPE (no PTFE)	20 mL	00350821008419	Grey	No	
007	0089_QC302	HDPE (no PTFE)	20 mL	00350821008405	Grey	No	
007	0089_QC302	HDPE (no PTFE)	20 mL	00350821008398	Grey	No	
008	0089_QC401	HDPE (no PTFE)	20 mL	00350621065877	Grey	No	
008	0089_QC401	HDPE (no PTFE)	20 mL	00350621066305	Grey	No	
009	0089_QC402	HDPE (no PTFE)	20 mL	00350621066740	Grey	No	

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2303178**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49630	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2023 10:50	Issue Date	: 16-Mar-2023
Client Requested Due Date	: 24-Mar-2023	Scheduled Reporting Date	: **24-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2303178-001	14-Mar-2023 08:48	0089_MW289_230314	✓	✓
EP2303178-002	14-Mar-2023 09:29	0089_MW288_230314	✓	✓
EP2303178-003	14-Mar-2023 12:52	0089_MW228_230314	✓	✓
EP2303178-004	14-Mar-2023 13:03	0089_MW227_230314	✓	✓
EP2303178-005	14-Mar-2023 14:13	0089_MW226_230314	✓	✓
EP2303178-006	14-Mar-2023 14:56	0089_QC301_230314	✓	
EP2303178-007	14-Mar-2023 14:49	0089_QC302_230314	✓	
EP2303178-008	14-Mar-2023 14:50	0089_QC401_230314	✓	
EP2303178-009	14-Mar-2023 14:51	0089_QC402_230314	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303178**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023 10:50
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Mar-2023
C-O-C number	: 49630	Issue Date	: 24-Mar-2023 16:39
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW289_230314	0089_MW288_230314	0089_MW228_230314	0089_MW227_230314	0089_MW226_230314
				Sampling date / time	14-Mar-2023 08:48	14-Mar-2023 09:29	14-Mar-2023 12:52	14-Mar-2023 13:03	14-Mar-2023 14:13
Compound	CAS Number	LOR	Unit		EP2303178-001	EP2303178-002	EP2303178-003	EP2303178-004	EP2303178-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		402	335	603	412	595
Total Alkalinity as CaCO3	----	1	mg/L		402	335	603	412	595
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		102	28	745	240	2180
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		122	59	4540	713	13800
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		97	85	142	99	376
Magnesium	7439-95-4	1	mg/L		31	20	356	65	908
Sodium	7440-23-5	1	mg/L		104	37	2660	444	7050
Potassium	7440-09-7	1	mg/L		5	4	126	25	387
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		13.6	8.94	156	33.3	446
ø Total Cations	----	0.01	meq/L		12.0	7.60	155	30.2	410
ø Ionic Balance	----	0.01	%		6.06	8.11	0.10	4.87	4.26
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.05	<0.02	0.16	0.06	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.07	<0.02	0.12	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		1.06	0.02	0.19	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.05	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		1.78	1.25	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	1.4	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	4.84	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		0.06	<0.02	5.00	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	1.18	<0.02	<0.02

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW289_230314	0089_MW288_230314	0089_MW228_230314	0089_MW227_230314	0089_MW226_230314
				Sampling date / time	14-Mar-2023 08:48	14-Mar-2023 09:29	14-Mar-2023 12:52	14-Mar-2023 13:03	14-Mar-2023 14:13
					EP2303178-001	EP2303178-002	EP2303178-003	EP2303178-004	EP2303178-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.05**	<0.01	**0.23**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	**0.91**	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW289_230314	0089_MW288_230314	0089_MW228_230314	0089_MW227_230314	0089_MW226_230314
				Sampling date / time	14-Mar-2023 08:48	14-Mar-2023 09:29	14-Mar-2023 12:52	14-Mar-2023 13:03	14-Mar-2023 14:13
Compound	CAS Number	LOR	Unit		EP2303178-001	EP2303178-002	EP2303178-003	EP2303178-004	EP2303178-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**3.12**	**1.27**	**14.0**	**0.06**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**2.84**	**1.27**	**0.19**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**3.00**	**1.27**	**13.9**	**0.06**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**109**	**111**	**108**	**114**	**107**
13C8-PFOA	----	0.02	%		**91.3**	**86.2**	**88.4**	**86.6**	**87.2**

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_230314	0089_QC302_230314	0089_QC401_230314	0089_QC402_230314	----
				Sampling date / time	14-Mar-2023 14:56	14-Mar-2023 14:49	14-Mar-2023 14:50	14-Mar-2023 14:51	----
Compound	CAS Number	LOR	Unit		EP2303178-006	EP2303178-007	EP2303178-008	EP2303178-009	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_230314	0089_QC302_230314	0089_QC401_230314	0089_QC402_230314	----
				Sampling date / time	14-Mar-2023 14:56	14-Mar-2023 14:49	14-Mar-2023 14:50	14-Mar-2023 14:51	----
Compound	CAS Number	LOR	Unit		EP2303178-006	EP2303178-007	EP2303178-008	EP2303178-009	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**113**	**110**	**109**	----
13C8-PFOA	----	0.02	%		**96.0**	**96.8**	**92.9**	**94.5**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303178**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Mar-2023
C-O-C number	: 49630	Issue Date	: 24-Mar-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4943561)									
EP2303177-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	352	351	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	352	351	0.0	0% - 20%
EP2303179-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	127	2.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	127	2.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4937762)									
EP2303178-001	0089_MW289_230314	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	102	100	2.4	0% - 20%
EP2303227-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2780	2860	2.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4937763)									
EP2303178-001	0089_MW289_230314	ED045G: Chloride	16887-00-6	1	mg/L	122	120	0.9	0% - 20%
EP2303227-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19400	19300	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4934505)									
EP2303175-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	468	452	3.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1440	1.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	11500	1.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	556	543	2.3	0% - 20%
EP2303175-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	465	463	0.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1490	1480	1.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	11900	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	572	569	0.6	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED093F: Dissolved Major Cations (QC Lot: 4934506)									
EP2303178-002	0089_MW288_230314	ED093F: Calcium	7440-70-2	1	mg/L	85	86	1.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	20	21	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	37	37	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4944224)									
EP2303175-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2303175-006	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4944233)									
EP2303177-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.03	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2303178-003	0089_MW228_230314	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.19	0.20	0.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.16	0.17	8.8	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.12	0.12	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4944224)									
EP2303175-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4944224) - continued									
EP2303175-001	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2303175-006	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4944233)									
EP2303177-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2303178-003	0089_MW228_230314	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.23	0.23	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	4.84	4.91	1.4	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	5.00	5.12	2.4	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.18	1.17	0.0	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.4	1.4	0.0	0% - 50%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4944224)									
EP2303175-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4944224) - continued									
EP2303175-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303175-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4944233)									
EP2303177-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303178-003	0089_MW228_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4944233) - continued									
EP2303178-003	0089_MW228_230314	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4944224)									
EP2303175-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303175-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4944233)									
EP2303177-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303178-003	0089_MW228_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.91	0.85	7.5	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4944233) - continued									
EP2303178-003	0089_MW228_230314	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4944224)									
EP2303175-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.03	0.03	0.0	No Limit
EP2303175-006	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4944233)									
EP2303177-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.03	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.03	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.03	40.0	No Limit
EP2303178-003	0089_MW228_230314	EP231X: Sum of PFAS	----	0.01	µg/L	14.0	14.2	1.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.19	0.20	5.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	13.9	14.0	1.0	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4943561)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	104	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4937762)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.4	89.9	112
				<1	500 mg/L	97.6	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4937763)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100.0	88.6	113
				<1	1000 mg/L	99.0	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4934505)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	106	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4934506)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	103	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4944224)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	93.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	92.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	83.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	89.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	123	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4944233)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	88.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	80.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	82.6	69.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4944233) - continued								
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	85.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	117	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944224)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	85.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	87.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	92.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	86.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	96.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	84.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	93.6	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944233)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	89.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	84.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	88.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	82.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	107	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4944224)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	85.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	82.1	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	95.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	85.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	91.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	105	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4944233)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	98.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	68.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	78.7	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	97.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	88.0	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	119	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4944224)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	94.1	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	87.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	84.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	116	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4944233)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	99.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	97.9	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	104	64.2	133
EP231P: PFAS Sums (QCLot: 4944224)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 4944233)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4937762)							
EP2303178-001	0089_MW289_230314	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	106	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4937763)							
EP2303178-001	0089_MW289_230314	ED045G: Chloride	16887-00-6	1000 mg/L	99.5	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4944224)							
EP2303175-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	87.0	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	81.9	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	79.5	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	85.5	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	83.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	77.8	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4944233)							
EP2303177-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.9	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	86.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	84.0	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	94.1	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	97.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	92.3	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944224)							
EP2303175-005	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	90.5	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	80.1	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	79.8	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	82.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	83.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	90.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	83.4	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	76.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	83.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	79.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	86.6	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944233)							
EP2303177-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	91.2	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	82.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	86.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	86.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	89.2	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	88.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	79.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	86.2	69.0	133

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944233) - continued							
EP2303177-002	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	86.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	77.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	95.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4944224)							
EP2303175-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	95.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	79.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	75.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	83.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	84.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	77.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4944233)							
EP2303177-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	87.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	84.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	74.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	93.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	91.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	98.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	88.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4944224)							
EP2303175-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	93.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	84.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	116	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	80.1	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4944233)							
EP2303177-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	100	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	90.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	102	67.0	138

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4944233) - continued							
EP2303177-002	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	76.4	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303178**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Site	: Stirling GW - JS	Issue Date	: 24-Mar-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW289_230314, 0089_MW288_230314, 0089_MW228_230314, 0089_MW227_230314, 0089_MW226_230314	**14-Mar-2023**	**----**	----	----	**22-Mar-2023**	28-Mar-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW289_230314, 0089_MW288_230314, 0089_MW228_230314, 0089_MW227_230314, 0089_MW226_230314	**14-Mar-2023**	**----**	----	----	**23-Mar-2023**	11-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW289_230314, 0089_MW288_230314, 0089_MW228_230314, 0089_MW227_230314, 0089_MW226_230314	**14-Mar-2023**	**----**	----	----	**23-Mar-2023**	11-Apr-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW289_230314, 0089_MW288_230314, 0089_MW228_230314, 0089_MW227_230314, 0089_MW226_230314	**14-Mar-2023**	**----**	----	----	**17-Mar-2023**	21-Mar-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC301_230314, 0089_QC302_230314, 0089_QC401_230314, 0089_QC402_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW289_230314, 0089_MW288_230314, 0089_MW228_230314, 0089_MW227_230314, 0089_MW226_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**24-Mar-2023**	10-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0089_QC301_230314, 0089_QC302_230314, 0089_QC401_230314, 0089_QC402_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0089_MW289_230314, 0089_MW288_230314, 0089_MW228_230314, 0089_MW227_230314, 0089_MW226_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**24-Mar-2023**	10-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0089_QC301_230314, 0089_QC302_230314, 0089_QC401_230314, 0089_QC402_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0089_MW289_230314, 0089_MW288_230314, 0089_MW228_230314, 0089_MW227_230314, 0089_MW226_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**24-Mar-2023**	10-Sep-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_QC301_230314, 0089_QC302_230314, 0089_QC401_230314, 0089_QC402_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0089_MW289_230314, 0089_MW288_230314, 0089_MW228_230314, 0089_MW227_230314, 0089_MW226_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**24-Mar-2023**	10-Sep-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_QC301_230314, 0089_QC302_230314, 0089_QC401_230314, 0089_QC402_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0089_MW289_230314, 0089_MW288_230314, 0089_MW228_230314, 0089_MW227_230314, 0089_MW226_230314	**14-Mar-2023**	**22-Mar-2023**	10-Sep-2023	✓	**24-Mar-2023**	10-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	27	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2303179

Telephone : -- 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMD_23 **Client:** Department of Defence **Project Manager:** [redacted]

ALS Compass COC Reference: [redacted] **# Samples:** 2 Esks **Phone:** ( )

49639; 49660; 49680; 49628; 49550; 49551 **Sampler:** [redacted]

Turnaround Requirements: Standard ____ Urgent ____ **Phone:** ( )

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 14/3/23 ~ 3:09pm.	**Date / Time:** 15/3 1050	**Date / Time:**	**Date / Time:**

CHAIN OF CUSTODY

ALS COC#: 49639 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW373		14/03/2023 09:38 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC116		14/03/2023 09:39 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW346		14/03/2023 09:52 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_QC118		14/03/2023 09:53 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_SW372		14/03/2023 10:10 AM	WATER	ALS: 5 Non ALS: 0	No	X		
006	0089_SW317		14/03/2023 10:52 AM	WATER	ALS: 5 Non ALS: 0	No	X		
007	0089_PW378		14/03/2023 11:00 AM	WATER	ALS: 3 Non ALS: 0	No	X		
008	0089_SW318		14/03/2023 11:14 AM	WATER	ALS: 5 Non ALS: 0	No	X		
009	0089_PW375		14/03/2023 11:16 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: **49639** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SW319		14/03/2023 11:43 AM	WATER	ALS: 5 Non ALS: 0	No	X		
011	0089_PW374		14/03/2023 11:45 AM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_PW405		14/03/2023 12:56 PM	WATER	ALS: 5 Non ALS: 0	No	X		
013	0089_SW406		14/03/2023 12:59 PM	WATER	ALS: 3 Non ALS: 0	No	X		
014	0089_PW407		14/03/2023 01:00 PM	WATER	ALS: 3 Non ALS: 0	No	X		
015	0089_SW408		14/03/2023 01:01 PM	WATER	ALS: 5 Non ALS: 0	No	X		
016	0089_PW409		14/03/2023 02:15 PM	WATER	ALS: 3 Non ALS: 0	No	X		
017	0089_SW410		14/03/2023 02:16 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 49639 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free Ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW373	HDPE (no PTFE)	20 mL	00350821008531	Grey	No	
001	0089_SW373	HDPE (no PTFE)	20 mL	00350821008551	Grey	No	
001	0089_SW373	Clear Plastic Bottle - Natural	125 mL	00070522189314	Green	No	
002	0089_QC116	HDPE (no PTFE)	20 mL	00350821008540	Grey	No	
002	0089_QC116	HDPE (no PTFE)	20 mL	00350821008506	Grey	No	
002	0089_QC116	Clear Plastic Bottle - Natural	125 mL	00070522189288	Green	No	
003	0089_PW346	Clear Plastic Bottle - Natural	125 mL	00070522171493	Green	No	
003	0089_PW346	HDPE (no PTFE)	20 mL	00350821008343	Grey	No	
003	0089_PW346	HDPE (no PTFE)	20 mL	00350821008293	Grey	No	
004	0089_QC118	Clear Plastic Bottle - Natural	125 mL	00070522171499	Green	No	
004	0089_QC118	HDPE (no PTFE)	20 mL	00350821008342	Grey	No	
004	0089_QC118	HDPE (no PTFE)	20 mL	00350821008462	Grey	No	
005	0089_SW372	Clear Plastic Bottle - Natural	125 mL	00070522171327	Green	No	
005	0089_SW372	HDPE (no PTFE)	20 mL	00350821008385	Grey	No	
005	0089_SW372	HDPE (no PTFE)	20 mL	00350621000598	Grey	No	
005	0089_SW372	HDPE (no PTFE)	20 mL	00350821008543	Grey	No	
005	0089_SW372	HDPE (no PTFE)	20 mL	00350621000586	Grey	No	
006	0089_SW317	HDPE (no PTFE)	20 mL	00350621000435	Grey	No	
006	0089_SW317	HDPE (no PTFE)	20 mL	00350821008300	Grey	No	
006	0089_SW317	HDPE (no PTFE)	20 mL	00350821008270	Grey	No	
006	0089_SW317	HDPE (no PTFE)	20 mL	00350621067059	Grey	No	
006	0089_SW317	Clear Plastic Bottle - Natural	125 mL	00070522171516	Green	No	
007	0089_PW378	Clear Plastic Bottle - Natural	125 mL	00070522189208	Green	No	
007	0089_PW378	HDPE (no PTFE)	20 mL	00350821008463	Grey	No	
007	0089_PW378	HDPE (no PTFE)	20 mL	00350821008488	Grey	No	
008	0089_SW318	HDPE (no PTFE)	20 mL	00350621000597	Grey	No	

CHAIN OF CUSTODY

COC#: 49639 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_SW318	Clear Plastic Bottle - Natural	125 mL	00070522189300	Green	No	
008	0089_SW318	HDPE (no PTFE)	20 mL	00350821008260	Grey	No	
008	0089_SW318	HDPE (no PTFE)	20 mL	00350821008553	Grey	No	
008	0089_SW318	HDPE (no PTFE)	20 mL	00350621000496	Grey	No	
009	0089_PW375	HDPE (no PTFE)	20 mL	00350821008466	Grey	No	
009	0089_PW375	Clear Plastic Bottle - Natural	125 mL	00070522189284	Green	No	
009	0089_PW375	HDPE (no PTFE)	20 mL	00350821008375	Grey	No	
010	0089_SW319	Clear Plastic Bottle - Natural	125 mL	00070522171513	Green	No	
010	0089_SW319	HDPE (no PTFE)	20 mL	00350821008550	Grey	No	
010	0089_SW319	HDPE (no PTFE)	20 mL	00350821012796	Grey	No	
010	0089_SW319	HDPE (no PTFE)	20 mL	00350621000596	Grey	No	
010	0089_SW319	HDPE (no PTFE)	20 mL	00350821008280	Grey	No	
011	0089_PW374	Clear Plastic Bottle - Natural	125 mL	00070522189216	Green	No	
011	0089_PW374	HDPE (no PTFE)	20 mL	00350821008282	Grey	No	
011	0089_PW374	HDPE (no PTFE)	20 mL	00350821008288	Grey	No	
012	0089_PW405	HDPE (no PTFE)	20 mL	00350019041345	Grey	No	
012	0089_PW405	HDPE (no PTFE)	20 mL	00350019041133	Grey	No	
012	0089_PW405	Clear Plastic Bottle - Natural	125 mL	00070522171528	Green	No	
012	0089_PW405	HDPE (no PTFE)	20 mL	00350821008529	Grey	No	
012	0089_PW405	HDPE (no PTFE)	20 mL	00350821008470	Grey	No	
013	0089_SW406	Clear Plastic Bottle - Natural	125 mL	00070522171583	Green	No	
013	0089_SW406	HDPE (no PTFE)	20 mL	00350821008421	Grey	No	
013	0089_SW406	HDPE (no PTFE)	20 mL	00350821008558	Grey	No	
014	0089_PW407	Clear Plastic Bottle - Natural	125 mL	00070522189222	Green	No	
014	0089_PW407	HDPE (no PTFE)	20 mL	00350821008347	Grey	No	
014	0089_PW407	HDPE (no PTFE)	20 mL	00350821008477	Grey	No	
015	0089_SW408	Clear Plastic Bottle - Natural	125 mL	00070522189212	Green	No	

CHAIN OF CUSTODY

ALS COC#: 49639 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

015	0089_SW408	HDPE (no PTFE)	20 mL	00350821008379	Grey	No	
015	0089_SW408	HDPE (no PTFE)	20 mL	00350821008479	Grey	No	
015	0089_SW408	HDPE (no PTFE)	20 mL	00350621000811	Grey	No	
015	0089_SW408	HDPE (no PTFE)	20 mL	00350621000564	Grey	No	
016	0089_PW409	Clear Plastic Bottle - Natural	125 mL	00070522171561	Green	No	
016	0089_PW409	HDPE (no PTFE)	20 mL	00350821008291	Grey	No	
016	0089_PW409	HDPE (no PTFE)	20 mL	00350821008414	Grey	No	
017	0089_SW410	Clear Plastic Bottle - Natural	125 mL	00070522189329	Green	No	
017	0089_SW410	HDPE (no PTFE)	20 mL	00350821008511	Grey	No	
017	0089_SW410	HDPE (no PTFE)	20 mL	00350821008352	Grey	No	

Total Bottle Count: ALS: 63, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2303179**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49639	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2023 10:50	Issue Date	: 15-Mar-2023
Client Requested Due Date	: 24-Mar-2023	Scheduled Reporting Date	: **24-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 17 / 17

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2303179-001	14-Mar-2023 09:38	0089_SW373_230314	✓	✓
EP2303179-002	14-Mar-2023 09:39	0089_QC116_230314	✓	✓
EP2303179-003	14-Mar-2023 09:52	0089_PW346_230314	✓	✓
EP2303179-004	14-Mar-2023 09:53	0089_QC118_230314	✓	✓
EP2303179-005	14-Mar-2023 10:10	0089_SW372_230314	✓	✓
EP2303179-006	14-Mar-2023 10:52	0089_SW317_230314	✓	✓
EP2303179-007	14-Mar-2023 11:00	0089_PW378_230314	✓	✓
EP2303179-008	14-Mar-2023 11:14	0089_SW318_230314	✓	✓
EP2303179-009	14-Mar-2023 11:16	0089_PW375_230314	✓	✓
EP2303179-010	14-Mar-2023 11:43	0089_SW319_230314	✓	✓
EP2303179-011	14-Mar-2023 11:45	0089_PW374_230314	✓	✓
EP2303179-012	14-Mar-2023 12:56	0089_PW405_230314	✓	✓
EP2303179-013	14-Mar-2023 12:59	0089_SW406_230314	✓	✓
EP2303179-014	14-Mar-2023 13:00	0089_PW407_230314	✓	✓
EP2303179-015	14-Mar-2023 13:01	0089_SW408_230314	✓	✓
EP2303179-016	14-Mar-2023 14:15	0089_PW409_230314	✓	✓
EP2303179-017	14-Mar-2023 14:16	0089_SW410_230314	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303179**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023 10:50
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2023
C-O-C number	: 49639	Issue Date	: 24-Mar-2023 16:42
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 17		
No. of samples analysed	: 17		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SW373_230314	0089_QC116_230314	0089_PW346_230314	0089_QC118_230314	0089_SW372_230314
				Sampling date / time	14-Mar-2023 09:38	14-Mar-2023 09:39	14-Mar-2023 09:52	14-Mar-2023 09:53	14-Mar-2023 10:10
					EP2303179-001	EP2303179-002	EP2303179-003	EP2303179-004	EP2303179-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**136**	**134**	**681**	**672**	**124**
Total Alkalinity as CaCO3	----	1	mg/L		**136**	**134**	**681**	**672**	**124**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2690**	**2690**	**2730**	**2790**	**2740**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19800**	**19500**	**21400**	**21600**	**20000**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**461**	**450**	**555**	**556**	**435**
Magnesium	7439-95-4	1	mg/L		**1460**	**1430**	**1590**	**1600**	**1410**
Sodium	7440-23-5	1	mg/L		**11900**	**11600**	**12700**	**12700**	**11400**
Potassium	7440-09-7	1	mg/L		**565**	**546**	**614**	**613**	**538**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**617**	**609**	**674**	**681**	**624**
ø Total Cations	----	0.01	meq/L		**675**	**659**	**727**	**728**	**647**
ø Ionic Balance	----	0.01	%		**4.48**	**3.94**	**3.75**	**3.32**	**1.86**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.02**	**0.02**	**0.01**	**0.02**	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.13**	**0.13**	**0.22**	**0.41**	**0.04**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW373_230314	0089_QC116_230314	0089_PW346_230314	0089_QC118_230314	0089_SW372_230314
				Sampling date / time	14-Mar-2023 09:38	14-Mar-2023 09:39	14-Mar-2023 09:52	14-Mar-2023 09:53	14-Mar-2023 10:10
Compound	CAS Number	LOR	Unit		EP2303179-001	EP2303179-002	EP2303179-003	EP2303179-004	EP2303179-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW373_230314	0089_QC116_230314	0089_PW346_230314	0089_QC118_230314	0089_SW372_230314
				Sampling date / time	14-Mar-2023 09:38	14-Mar-2023 09:39	14-Mar-2023 09:52	14-Mar-2023 09:53	14-Mar-2023 10:10
Compound	CAS Number	LOR	Unit		EP2303179-001	EP2303179-002	EP2303179-003	EP2303179-004	EP2303179-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.15**	**0.15**	**0.23**	**0.43**	**0.04**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.15**	**0.15**	**0.23**	**0.43**	**0.04**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.15**	**0.15**	**0.23**	**0.43**	**0.04**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**118**	**107**	**102**	**101**	**110**
13C8-PFOA	----	0.02	%		**96.9**	**95.2**	**89.7**	**98.3**	**93.3**

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SW317_230314	0089_PW378_230314	0089_SW318_230314	0089_PW375_230314	0089_SW319_230314
				Sampling date / time	14-Mar-2023 10:52	14-Mar-2023 11:00	14-Mar-2023 11:14	14-Mar-2023 11:16	14-Mar-2023 11:43
					EP2303179-006	EP2303179-007	EP2303179-008	EP2303179-009	EP2303179-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**125**	**342**	**124**	**215**	**126**
Total Alkalinity as CaCO3	----	1	mg/L		**125**	**342**	**124**	**215**	**126**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2750**	**1250**	**2710**	**2290**	**2710**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19700**	**7320**	**19800**	**16100**	**19900**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**436**	**186**	**431**	**351**	**429**
Magnesium	7439-95-4	1	mg/L		**1410**	**543**	**1400**	**1140**	**1400**
Sodium	7440-23-5	1	mg/L		**11500**	**3950**	**11300**	**9170**	**11200**
Potassium	7440-09-7	1	mg/L		**538**	**201**	**534**	**438**	**533**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**615**	**239**	**617**	**506**	**620**
ø Total Cations	----	0.01	meq/L		**652**	**231**	**642**	**521**	**637**
ø Ionic Balance	----	0.01	%		**2.86**	**1.79**	**1.94**	**1.49**	**1.36**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.06**	<0.01	**0.02**	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW317_230314	0089_PW378_230314	0089_SW318_230314	0089_PW375_230314	0089_SW319_230314
				Sampling date / time	14-Mar-2023 10:52	14-Mar-2023 11:00	14-Mar-2023 11:14	14-Mar-2023 11:16	14-Mar-2023 11:43
Compound	CAS Number	LOR	Unit		EP2303179-006	EP2303179-007	EP2303179-008	EP2303179-009	EP2303179-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW317_230314	0089_PW378_230314	0089_SW318_230314	0089_PW375_230314	0089_SW319_230314
				Sampling date / time	14-Mar-2023 10:52	14-Mar-2023 11:00	14-Mar-2023 11:14	14-Mar-2023 11:16	14-Mar-2023 11:43
Compound	CAS Number	LOR	Unit		EP2303179-006	EP2303179-007	EP2303179-008	EP2303179-009	EP2303179-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.06**	<0.01	**0.02**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.06**	<0.01	**0.02**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.06**	<0.01	**0.02**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**95.2**	**101**	**103**	**101**
13C8-PFOA	----	0.02	%		**96.8**	**96.1**	**96.1**	**96.3**	**89.3**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW374_230314	0089_PW405_230314	0089_SW406_230314	0089_PW407_230314	0089_SW408_230314
				Sampling date / time	14-Mar-2023 11:45	14-Mar-2023 12:56	14-Mar-2023 12:59	14-Mar-2023 13:00	14-Mar-2023 13:01
Compound	CAS Number	LOR	Unit		EP2303179-011	EP2303179-012	EP2303179-013	EP2303179-014	EP2303179-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		126	129	127	252	133
Total Alkalinity as CaCO3	----	1	mg/L		126	129	127	252	133
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2870	2800	2820	2850	2720
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20400	19600	20300	17200	19500
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		453	450	435	381	456
Magnesium	7439-95-4	1	mg/L		1460	1440	1420	1200	1460
Sodium	7440-23-5	1	mg/L		11800	11700	11400	9570	11800
Potassium	7440-09-7	1	mg/L		565	552	542	456	555
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		638	614	634	550	609
ø Total Cations	----	0.01	meq/L		670	664	648	546	670
ø Ionic Balance	----	0.01	%		2.50	3.93	1.12	0.35	4.77
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.08	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	0.16	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	0.50	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW374_230314	0089_PW405_230314	0089_SW406_230314	0089_PW407_230314	0089_SW408_230314
				Sampling date / time	14-Mar-2023 11:45	14-Mar-2023 12:56	14-Mar-2023 12:59	14-Mar-2023 13:00	14-Mar-2023 13:01
Compound	CAS Number	LOR	Unit		EP2303179-011	EP2303179-012	EP2303179-013	EP2303179-014	EP2303179-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW374_230314	0089_PW405_230314	0089_SW406_230314	0089_PW407_230314	0089_SW408_230314
				Sampling date / time	14-Mar-2023 11:45	14-Mar-2023 12:56	14-Mar-2023 12:59	14-Mar-2023 13:00	14-Mar-2023 13:01
Compound	CAS Number	LOR	Unit		EP2303179-011	EP2303179-012	EP2303179-013	EP2303179-014	EP2303179-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.75**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.01**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.67**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**138**	**99.2**	**120**	**92.6**
13C8-PFOA	----	0.02	%		**89.2**	**116**	**97.8**	**97.9**	**96.8**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW409_230314	0089_SW410_230314	----	----	----
				Sampling date / time	14-Mar-2023 14:15	14-Mar-2023 14:16	----	----	----
Compound	CAS Number	LOR	Unit		EP2303179-016	EP2303179-017	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**190**	**122**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**190**	**122**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**3160**	**2800**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**23300**	**19700**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**505**	**440**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1650**	**1420**	----	----	----
Sodium	7440-23-5	1	mg/L		**13400**	**11500**	----	----	----
Potassium	7440-09-7	1	mg/L		**650**	**544**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**727**	**616**	----	----	----
ø Total Cations	----	0.01	meq/L		**760**	**653**	----	----	----
ø Ionic Balance	----	0.01	%		**2.26**	**2.88**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW409_230314	0089_SW410_230314	----	----	----
				Sampling date / time	14-Mar-2023 14:15	14-Mar-2023 14:16	----	----	----
Compound	CAS Number	LOR	Unit		EP2303179-016	EP2303179-017	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW409_230314	0089_SW410_230314	----	----	----
			Sampling date / time	14-Mar-2023 14:15	14-Mar-2023 14:16	----	----	----
Compound	CAS Number	LOR	Unit	EP2303179-016	EP2303179-017	--------	--------	--------
				Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	----	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**120**	**92.1**	----	----	----
13C8-PFOA	----	0.02	%	**91.8**	**83.4**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303179**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2023
C-O-C number	: 49639	Issue Date	: 24-Mar-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 17		
No. of samples analysed	: 17		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4943561)									
EP2303177-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	352	351	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	352	351	0.0	0% - 20%
EP2303179-005	0089_SW372_230314	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	127	2.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	127	2.2	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4943562)									
EP2303179-015	0089_SW408_230314	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	133	130	2.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	133	130	2.1	0% - 20%
EP2303221-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	174	177	1.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	174	177	1.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4931947)									
EP2303086-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2800	2810	0.4	0% - 20%
EP2303086-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2910	2880	0.8	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4931950)									
EP2303151-013	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	647	640	1.1	0% - 20%
EP2303179-007	0089_PW378_230314	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1250	1240	1.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 4931948)									
EP2303086-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	20100	20000	0.2	0% - 20%
EP2303086-011	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	20500	20400	0.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4931949)									
EP2303151-013	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	15700	15800	0.9	0% - 20%
EP2303179-007	0089_PW378_230314	ED045G: Chloride	16887-00-6	1	mg/L	7320	7120	2.7	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4931872)									
EP2303179-001	0089_SW373_230314	ED093F: Calcium	7440-70-2	1	mg/L	461	454	1.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1450	1.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11900	11600	2.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	565	552	2.3	0% - 20%
EP2303179-011	0089_PW374_230314	ED093F: Calcium	7440-70-2	1	mg/L	453	496	9.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1600	8.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11800	13000	9.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	565	617	8.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4933638)									
EP2303179-005	0089_SW372_230314	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2303179-011	0089_PW374_230314	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4933638)									
EP2303179-005	0089_SW372_230314	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4933638) - continued									
EP2303179-011	0089_PW374_230314	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4933638)									
EP2303179-005	0089_SW372_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303179-011	0089_PW374_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4933638)									
EP2303179-005	0089_SW372_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4933638) - continued									
EP2303179-005	0089_SW372_230314	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303179-011	0089_PW374_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4933638)									
EP2303179-005	0089_SW372_230314	EP231X: Sum of PFAS	----	0.01	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.04	0.04	0.0	No Limit
EP2303179-011	0089_PW374_230314	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4943561)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	104	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 4943562)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	104	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4931947)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	89.9	112
				<1	500 mg/L	98.7	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4931950)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.8	89.9	112
				<1	500 mg/L	98.8	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4931948)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	88.6	113
				<1	1000 mg/L	100	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 4931949)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	99.2	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4931872)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.0	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4933638)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	83.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	90.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	78.2	68.0	131

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4933638) - continued								
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	82.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	75.3	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4933638)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	88.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	82.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	79.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	84.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	86.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	86.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	89.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	99.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4933638)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	75.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	74.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.3	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	112	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4933638)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	93.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	89.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	118	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	103	64.2	133
EP231P: PFAS Sums (QCLot: 4933638)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4931947)							
EP2303086-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4931950)							
EP2303151-013	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4931948)							
EP2303086-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4931949)							
EP2303151-013	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4933638)							
EP2303179-008	0089_SW318_230314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.1109 µg/L	106	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.116 µg/L	93.1	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.1172 µg/L	119	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.119 µg/L	110	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.116 µg/L	117	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.1205 µg/L	73.4	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4933638)							
EP2303179-008	0089_SW318_230314	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.625 µg/L	107	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.125 µg/L	123	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.125 µg/L	91.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.125 µg/L	102	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.125 µg/L	130	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.125 µg/L	126	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.125 µg/L	116	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.125 µg/L	105	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.125 µg/L	90.8	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.125 µg/L	100	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.125 µg/L	90.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4933638)							
EP2303179-008	0089_SW318_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.125 µg/L	97.2	59.0	135

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4933638) - continued							
EP2303179-008	0089_SW318_230314	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.3125 µg/L	83.2	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.3125 µg/L	71.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.3125 µg/L	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.3125 µg/L	88.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.125 µg/L	105	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.125 µg/L	96.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4933638)							
EP2303179-008	0089_SW318_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.117 µg/L	126	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.1189 µg/L	140	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.12 µg/L	120	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.12075 µg/L	76.6	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303179**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Site	: Stirling SW/PW - JS	Issue Date	: 24-Mar-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 17
Order number	: pfas-omp/Stirling	No. of samples analysed	: 17

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2303086--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2303151--013	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2303086--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2303151--013	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW373_230314, 0089_QC116_230314, 0089_PW346_230314, 0089_QC118_230314, 0089_SW372_230314, 0089_SW317_230314, 0089_PW378_230314, 0089_SW318_230314, 0089_PW375_230314, 0089_SW319_230314, 0089_PW374_230314, 0089_PW405_230314, 0089_SW406_230314, 0089_PW407_230314, 0089_SW408_230314, 0089_PW409_230314, 0089_SW410_230314	**14-Mar-2023**	**----**	----	----	**22-Mar-2023**	28-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW373_230314, 0089_QC116_230314, 0089_PW346_230314, 0089_QC118_230314, 0089_SW372_230314, 0089_SW317_230314, 0089_PW378_230314, 0089_SW318_230314, 0089_PW375_230314, 0089_SW319_230314, 0089_PW374_230314, 0089_PW405_230314, 0089_SW406_230314, 0089_PW407_230314, 0089_SW408_230314, 0089_PW409_230314, 0089_SW410_230314	**14-Mar-2023**	**----**	----	----	**22-Mar-2023**	11-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW373_230314, 0089_QC116_230314, 0089_PW346_230314, 0089_QC118_230314, 0089_SW372_230314, 0089_SW317_230314, 0089_PW378_230314, 0089_SW318_230314, 0089_PW375_230314, 0089_SW319_230314, 0089_PW374_230314, 0089_PW405_230314, 0089_SW406_230314, 0089_PW407_230314, 0089_SW408_230314, 0089_PW409_230314, 0089_SW410_230314	**14-Mar-2023**	**----**	----	----	**22-Mar-2023**	11-Apr-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW373_230314, 0089_QC116_230314, 0089_PW346_230314, 0089_QC118_230314, 0089_SW372_230314, 0089_SW317_230314, 0089_PW378_230314, 0089_SW318_230314, 0089_PW375_230314, 0089_SW319_230314, 0089_PW374_230314, 0089_PW405_230314, 0089_SW406_230314, 0089_PW407_230314, 0089_SW408_230314, 0089_PW409_230314, 0089_SW410_230314	**14-Mar-2023**	**----**	----	----	**16-Mar-2023**	21-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW373_230314, 0089_QC116_230314, 0089_PW346_230314, 0089_QC118_230314, 0089_SW372_230314, 0089_SW317_230314, 0089_PW378_230314, 0089_SW318_230314, 0089_PW375_230314, 0089_SW319_230314, 0089_PW374_230314, 0089_PW405_230314, 0089_SW406_230314, 0089_PW407_230314, 0089_SW408_230314, 0089_PW409_230314, 0089_SW410_230314	**14-Mar-2023**	**21-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW373_230314, 0089_QC116_230314, 0089_PW346_230314, 0089_QC118_230314, 0089_SW372_230314, 0089_SW317_230314, 0089_PW378_230314, 0089_SW318_230314, 0089_PW375_230314, 0089_SW319_230314, 0089_PW374_230314, 0089_PW405_230314, 0089_SW406_230314, 0089_PW407_230314, 0089_SW408_230314, 0089_PW409_230314, 0089_SW410_230314	**14-Mar-2023**	**21-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW373_230314, 0089_QC116_230314, 0089_PW346_230314, 0089_QC118_230314, 0089_SW372_230314, 0089_SW317_230314, 0089_PW378_230314, 0089_SW318_230314, 0089_PW375_230314, 0089_SW319_230314, 0089_PW374_230314, 0089_PW405_230314, 0089_SW406_230314, 0089_PW407_230314, 0089_SW408_230314, 0089_PW409_230314, 0089_SW410_230314	**14-Mar-2023**	**21-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW373_230314, 0089_QC116_230314, 0089_PW346_230314, 0089_QC118_230314, 0089_SW372_230314, 0089_SW317_230314, 0089_PW378_230314, 0089_SW318_230314, 0089_PW375_230314, 0089_SW319_230314, 0089_PW374_230314, 0089_PW405_230314, 0089_SW406_230314, 0089_PW407_230314, 0089_SW408_230314, 0089_PW409_230314, 0089_SW410_230314	**14-Mar-2023**	**21-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW373_230314, 0089_QC116_230314, 0089_PW346_230314, 0089_QC118_230314, 0089_SW372_230314, 0089_SW317_230314, 0089_PW378_230314, 0089_SW318_230314, 0089_PW375_230314, 0089_SW319_230314, 0089_PW374_230314, 0089_PW405_230314, 0089_SW406_230314, 0089_PW407_230314, 0089_SW408_230314, 0089_PW409_230314, 0089_SW410_230314	**14-Mar-2023**	**21-Mar-2023**	10-Sep-2023	✓	**23-Mar-2023**	10-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass SAMPLING Intelligence

Environmental Division
Perth
Work Order Reference
EP2303180

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASDMD_23 **Client:** Department of Defence **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: [redacted] **# Samples:** 2 Eskis **Sampler:** [redacted]

Phone: [redacted]

49639; 49640; 49639; 49628; 49550; 49551

Turnaround Requirements: (Standard) _____ Urgent _____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 14/3/23 ~ 3:00 pm.	Date / Time: 15/3 1050	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: **49640** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD346		14/03/2023 09:50 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_QC117		14/03/2023 09:51 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD378		14/03/2023 11:01 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD375		14/03/2023 11:17 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD374		14/03/2023 11:46 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD405		14/03/2023 12:54 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD407		14/03/2023 12:55 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
008	0089_SD409		14/03/2023 02:16 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

Tuesday, March 14, 2023 10:18:11 PM

CHAIN OF CUSTODY

(ALS) COC#: **49640** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD346	HDPE Soil Jar	200 mL	00621122022747	Grey	No	
002	0089_QC117	HDPE Soil Jar	200 mL	00621122022868	Grey	No	
003	0089_SD378	HDPE Soil Jar	200 mL	00621122022779	Grey	No	
004	0089_SD375	HDPE Soil Jar	200 mL	00621122022774	Grey	No	
005	0089_SD374	HDPE Soil Jar	200 mL	00621122022848	Grey	No	
006	0089_SD405	HDPE Soil Jar	200 mL	00620322076767	Grey	No	
007	0089_SD407	HDPE Soil Jar	200 mL	00621122022835	Grey	No	
008	0089_SD409	HDPE Soil Jar	200 mL	00621122022753	Grey	No	

Total Bottle Count: ALS: 8, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2303180**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49640	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2023 10:50	Issue Date	: 15-Mar-2023
Client Requested Due Date	: 24-Mar-2023	Scheduled Reporting Date	: **24-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2303180-001	14-Mar-2023 09:50	0089_SD346_230314	✓	✓
EP2303180-002	14-Mar-2023 09:51	0089_QC117_230314	✓	✓
EP2303180-003	14-Mar-2023 11:01	0089_SD378_230314	✓	✓
EP2303180-004	14-Mar-2023 11:17	0089_SD375_230314	✓	✓
EP2303180-005	14-Mar-2023 11:46	0089_SD374_230314	✓	✓
EP2303180-006	14-Mar-2023 12:54	0089_SD405_230314	✓	✓
EP2303180-007	14-Mar-2023 12:55	0089_SD407_230314	✓	✓
EP2303180-008	14-Mar-2023 14:16	0089_SD409_230314	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303180**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023 10:50
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49640	Issue Date	: 24-Mar-2023 16:40
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD346_230314	0089_QC117_230314	0089_SD378_230314	0089_SD375_230314	0089_SD374_230314
				Sampling date / time	14-Mar-2023 09:50	14-Mar-2023 09:51	14-Mar-2023 11:01	14-Mar-2023 11:17	14-Mar-2023 11:46
					EP2303180-001	EP2303180-002	EP2303180-003	EP2303180-004	EP2303180-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**29.2**	**28.0**	**15.7**	**9.8**	**20.5**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0004**	**0.0004**	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD346_230314	0089_QC117_230314	0089_SD378_230314	0089_SD375_230314	0089_SD374_230314
				Sampling date / time	14-Mar-2023 09:50	14-Mar-2023 09:51	14-Mar-2023 11:01	14-Mar-2023 11:17	14-Mar-2023 11:46
Compound	CAS Number	LOR	Unit		EP2303180-001	EP2303180-002	EP2303180-003	EP2303180-004	EP2303180-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0004**	**0.0004**	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0004**	**0.0004**	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0004**	**0.0004**	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**118**	**109**	**111**	**97.5**	**112**
13C8-PFOA	----	0.0002	%		**94.0**	**89.0**	**96.5**	**92.0**	**91.0**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD405_230314	0089_SD407_230314	0089_SD409_230314	----	----
				Sampling date / time	14-Mar-2023 12:54	14-Mar-2023 12:55	14-Mar-2023 14:16	----	----
Compound	CAS Number	LOR	Unit		EP2303180-006	EP2303180-007	EP2303180-008	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**28.4**	**27.7**	**28.6**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD405_230314	0089_SD407_230314	0089_SD409_230314	----	----
				Sampling date / time	14-Mar-2023 12:54	14-Mar-2023 12:55	14-Mar-2023 14:16	----	----
Compound	CAS Number	LOR	Unit		EP2303180-006	EP2303180-007	EP2303180-008	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		111	110	107	----	----
13C8-PFOA	----	0.0002	%		93.0	92.0	89.5	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303180**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49640	Issue Date	: 24-Mar-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4943679)									
EP2303176-001	Anonymous	EA055: Moisture Content	----	0.1	%	35.0	35.5	1.3	0% - 20%
EP2303180-001	0089_SD346_230314	EA055: Moisture Content	----	0.1	%	29.2	29.9	2.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4937632)									
EP2303176-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0004	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2303180-002	0089_QC117_230314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4937633)									
EP2303180-006	0089_SD405_230314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4937632)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4937632) - continued									
EP2303176-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2303180-002	0089_QC117_230314	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4937633)									
EP2303180-006	0089_SD405_230314	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4937632)									
EP2303176-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4937632) - continued									
EP2303176-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2303180-002	0089_QC117_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4937633)									
EP2303180-006	0089_SD405_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4937632)									
EP2303176-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4937632) - continued									
EP2303176-001	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2303180-002	0089_QC117_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4937633)									
EP2303180-006	0089_SD405_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4937632)									
EP2303176-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
EP2303180-002	0089_QC117_230314	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4937633)									
EP2303180-006	0089_SD405_230314	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937632)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	110	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	84.3	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	96.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	90.1	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	94.6	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937633)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	104	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	83.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	92.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	94.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	89.6	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937632)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	99.3	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	104	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937633)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	99.6	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	64.0	136

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937633) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	99.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937632)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	130	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.5	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	80.6	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.1	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.9	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937633)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	136	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.8	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	83.2	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.4	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.4	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937632)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	107	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	122	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	95.0	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937633)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	104	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	101	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	116	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	83.8	54.8	124
EP231P: PFAS Sums (QCLot: 4937632)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 4937632) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 4937633)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937632)							
EP2303176-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	102	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	94.9	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	82.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	98.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	91.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	89.5	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937633)							
EP2303180-007	0089_SD407_230314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	96.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	89.7	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	79.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	93.7	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	86.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	85.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937632)							
EP2303176-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	98.3	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	87.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	88.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	94.3	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	94.4	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	100	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	100	69.0	133

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937632) - continued							
EP2303176-002	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	101	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	91.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	86.3	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	101	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937633)							
EP2303180-007	0089_SD407_230314	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	98.7	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	84.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	87.6	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	90.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	92.4	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	98.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	91.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	97.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	86.0	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	82.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	95.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937632)							
EP2303176-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	121	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	85.9	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	89.7	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	95.4	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	116	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	110	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937633)							
EP2303180-007	0089_SD407_230314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	120	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	82.7	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	97.1	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	97.8	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	93.9	60.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937633) - continued							
EP2303180-007	0089_SD407_230314	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	106	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	89.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937632)							
EP2303176-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	106	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	102	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	121	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	95.7	60.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937633)							
EP2303180-007	0089_SD407_230314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	109	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	122	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	90.8	60.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303180**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Site	: Stirling SD - JS	Issue Date	: 24-Mar-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 8
Order number	: pfas-omp/Stirling	No. of samples analysed	: 8

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD346_230314,	0089_QC117_230314,	**14-Mar-2023**	**----**	----	----	**22-Mar-2023**	28-Mar-2023	✓
0089_SD378_230314,	0089_SD375_230314,							
0089_SD374_230314,	0089_SD405_230314,							
0089_SD407_230314,	0089_SD409_230314							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD346_230314,	0089_QC117_230314,	**14-Mar-2023**	**17-Mar-2023**	10-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓
0089_SD378_230314,	0089_SD375_230314,							
0089_SD374_230314,	0089_SD405_230314,							
0089_SD407_230314,	0089_SD409_230314							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD346_230314,	0089_QC117_230314,	**14-Mar-2023**	**17-Mar-2023**	10-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓
0089_SD378_230314,	0089_SD375_230314,							
0089_SD374_230314,	0089_SD405_230314,							
0089_SD407_230314,	0089_SD409_230314							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD346_230314,	0089_QC117_230314,	**14-Mar-2023**	**17-Mar-2023**	10-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓
0089_SD378_230314,	0089_SD375_230314,							
0089_SD374_230314,	0089_SD405_230314,							
0089_SD407_230314,	0089_SD409_230314							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD346_230314,	0089_QC117_230314,	**14-Mar-2023**	**17-Mar-2023**	10-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓
0089_SD378_230314,	0089_SD375_230314,							
0089_SD374_230314,	0089_SD405_230314,							
0089_SD407_230314,	0089_SD409_230314							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD346_230314, 0089_QC117_230314, 0089_SD378_230314, 0089_SD375_230314, 0089_SD374_230314, 0089_SD405_230314, 0089_SD407_230314, 0089_SD409_230314	**14-Mar-2023**	**17-Mar-2023**	10-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	23	**13.04**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2303198

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]
Phone: ( )

ALS Compass COC Reference: #49700, #49705, #49669, #49702, #49703 **# Samples:** **Sampler:**
Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 15/3/23 ~2:00	Date / Time: 16/3 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 49668 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW217		15/03/2023 08:36 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_MW282		15/03/2023 09:30 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW220		15/03/2023 09:31 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW224		15/03/2023 09:32 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW245		15/03/2023 09:41 AM	WATER	ALS: 5 Non ALS: 0	No	X		extra PFAS bottles for lab QC
006	0089_MW243		15/03/2023 09:51 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_MW240		15/03/2023 10:03 AM	WATER	ALS: 3 Non ALS: 0	No	X		
008	0089_MW238		15/03/2023 10:13 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_MW239		15/03/2023 10:25 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 49668 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW242		15/03/2023 10:44 AM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_MW269		15/03/2023 11:28 AM	WATER	ALS: 5 Non ALS: 0	No	X		extra PFAS bottles for lab QC
012	0089_MW268		15/03/2023 11:26 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 49668 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW217	HDPE (no PTFE)	20 mL	00350522039196	Grey	No	
001	0089_MW217	Clear Plastic Bottle - Natural	125 mL	00070522171484	Green	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00350522039170	Grey	No	
002	0089_MW282	HDPE (no PTFE)	20 mL	00350821008404	Grey	No	
002	0089_MW282	HDPE (no PTFE)	20 mL	00350821008341	Grey	No	
002	0089_MW282	Clear Plastic Bottle - Natural	125 mL	00070522189354	Green	No	
003	0089_MW220	HDPE (no PTFE)	20 mL	00350821008535	Grey	No	
003	0089_MW220	HDPE (no PTFE)	20 mL	00350821008510	Grey	No	
003	0089_MW220	Clear Plastic Bottle - Natural	125 mL	00070522189297	Green	No	
004	0089_MW224	Clear Plastic Bottle - Natural	125 mL	00070522171589	Green	No	
004	0089_MW224	HDPE (no PTFE)	20 mL	00350522039124	Grey	No	
004	0089_MW224	HDPE (no PTFE)	20 mL	00350522039024	Grey	No	
005	0089_MW245	HDPE (no PTFE)	20 mL	00350019041195	Grey	No	
005	0089_MW245	Clear Plastic Bottle - Natural	125 mL	00070522189272	Green	No	
005	0089_MW245	HDPE (no PTFE)	20 mL	00350019041189	Grey	No	
005	0089_MW245	HDPE (no PTFE)	20 mL	00350821008525	Grey	No	
005	0089_MW245	HDPE (no PTFE)	20 mL	00350821008285	Grey	No	
006	0089_MW243	Clear Plastic Bottle - Natural	125 mL	00070522171489	Green	No	
006	0089_MW243	HDPE (no PTFE)	20 mL	00350522039053	Grey	No	
006	0089_MW243	HDPE (no PTFE)	20 mL	00350522039109	Grey	No	
007	0089_MW240	Clear Plastic Bottle - Natural	125 mL	00070522171547	Green	No	
007	0089_MW240	HDPE (no PTFE)	20 mL	00350821008380	Grey	No	
007	0089_MW240	HDPE (no PTFE)	20 mL	00350821008504	Grey	No	
008	0089_MW238	HDPE (no PTFE)	20 mL	00350821008384	Grey	No	
008	0089_MW238	Clear Plastic Bottle - Natural	125 mL	00070522189283	Green	No	
008	0089_MW238	HDPE (no PTFE)	20 mL	00350821008262	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 49668 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted]

/ ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW239	Clear Plastic Bottle - Natural	125 mL	00070522189289	Green	No	
009	0089_MW239	HDPE (no PTFE)	20 mL	00350522039266	Grey	No	
009	0089_MW239	HDPE (no PTFE)	20 mL	00350522039015	Grey	No	
010	0089_MW242	Clear Plastic Bottle - Natural	125 mL	00070522171542	Green	No	
010	0089_MW242	HDPE (no PTFE)	20 mL	00350522039091	Grey	No	
010	0089_MW242	HDPE (no PTFE)	20 mL	00350522039210	Grey	No	
011	0089_MW269	HDPE (no PTFE)	20 mL	00350821008530	Grey	No	
011	0089_MW269	HDPE (no PTFE)	20 mL	00350522039214	Grey	No	
011	0089_MW269	HDPE (no PTFE)	20 mL	00350821008354	Grey	No	
011	0089_MW269	HDPE (no PTFE)	20 mL	00350522039013	Grey	No	
012	0089_MW268	Clear Plastic Bottle - Natural	125 mL	00070522171317	Green	No	
012	0089_MW268	Clear Plastic Bottle - Natural	125 mL	00070522171570	Green	No	
012	0089_MW268	HDPE (no PTFE)	20 mL	00350821008261	Grey	No	
012	0089_MW268	HDPE (no PTFE)	20 mL	00350821008396	Grey	No	

Total Bottle Count: ALS: 40, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2303198**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49668	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 16-Mar-2023 12:00	Issue Date	: 17-Mar-2023
Client Requested Due Date	: 27-Mar-2023	Scheduled Reporting Date	: **27-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 12 / 12

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2303198-001	15-Mar-2023 08:36	0089_MW217_230315	✓	✓
EP2303198-002	15-Mar-2023 09:30	0089_MW282_230315	✓	✓
EP2303198-003	15-Mar-2023 09:31	0089_MW220_230315	✓	✓
EP2303198-004	15-Mar-2023 09:32	0089_MW224_230315	✓	✓
EP2303198-005	15-Mar-2023 09:41	0089_MW245_230315	✓	✓
EP2303198-006	15-Mar-2023 09:51	0089_MW243_230315	✓	✓
EP2303198-007	15-Mar-2023 10:03	0089_MW240_230315	✓	✓
EP2303198-008	15-Mar-2023 10:13	0089_MW238_230315	✓	✓
EP2303198-009	15-Mar-2023 10:25	0089_MW239_230315	✓	✓
EP2303198-010	15-Mar-2023 10:44	0089_MW242_230315	✓	✓
EP2303198-011	15-Mar-2023 11:28	0089_MW269_230315	✓	✓
EP2303198-012	15-Mar-2023 11:26	0089_MW268_230315	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303198**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49668	Issue Date	: 27-Mar-2023 17:28
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_230315	0089_MW282_230315	0089_MW220_230315	0089_MW224_230315	0089_MW245_230315
				Sampling date / time	15-Mar-2023 08:36	15-Mar-2023 09:30	15-Mar-2023 09:31	15-Mar-2023 09:32	15-Mar-2023 09:41
Compound	CAS Number	LOR	Unit		EP2303198-001	EP2303198-002	EP2303198-003	EP2303198-004	EP2303198-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		277	517	280	261	256
Total Alkalinity as CaCO3	----	1	mg/L		277	517	280	261	256
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		70	24	29	56	<1
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		50	55	50	110	34
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		114	172	80	48	71
Magnesium	7439-95-4	1	mg/L		15	26	15	20	8
Sodium	7440-23-5	1	mg/L		40	36	38	89	19
Potassium	7440-09-7	1	mg/L		12	2	8	4	2
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		8.40	12.4	7.61	9.48	6.07
ø Total Cations	----	0.01	meq/L		8.97	12.3	7.08	8.01	5.08
ø Ionic Balance	----	0.01	%		3.27	0.17	3.57	8.39	8.92
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.03	2.85	0.06	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.03	6.23	0.05	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.02	59.4	0.66	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	6.22	0.10	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.03	47.9	12.0	<0.01	0.04
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		1.9	1.4	0.2	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		8.73	2.02	0.21	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		9.30	9.52	0.27	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.90	3.50	0.07	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_230315	0089_MW282_230315	0089_MW220_230315	0089_MW224_230315	0089_MW245_230315
				Sampling date / time	15-Mar-2023 08:36	15-Mar-2023 09:30	15-Mar-2023 09:31	15-Mar-2023 09:32	15-Mar-2023 09:41
Compound	CAS Number	LOR	Unit		EP2303198-001	EP2303198-002	EP2303198-003	EP2303198-004	EP2303198-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.34**	**8.27**	**0.10**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	**0.03**	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**21.0**	**0.06**	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**0.21**	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_230315	0089_MW282_230315	0089_MW220_230315	0089_MW224_230315	0089_MW245_230315
				Sampling date / time	15-Mar-2023 08:36	15-Mar-2023 09:30	15-Mar-2023 09:31	15-Mar-2023 09:32	15-Mar-2023 09:41
Compound	CAS Number	LOR	Unit		EP2303198-001	EP2303198-002	EP2303198-003	EP2303198-004	EP2303198-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**42.5**	**147**	**13.8**	<0.01	**0.04**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.05**	**107**	**12.7**	<0.01	**0.04**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**42.5**	**135**	**13.6**	<0.01	**0.04**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.6**	**94.4**	**102**	**114**	**105**
13C8-PFOA	----	0.02	%		**87.6**	**87.0**	**90.2**	**85.8**	**89.0**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_230315	0089_MW240_230315	0089_MW238_230315	0089_MW239_230315	0089_MW242_230315
				Sampling date / time	15-Mar-2023 09:51	15-Mar-2023 10:03	15-Mar-2023 10:13	15-Mar-2023 10:25	15-Mar-2023 10:44
Compound	CAS Number	LOR	Unit		EP2303198-006	EP2303198-007	EP2303198-008	EP2303198-009	EP2303198-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		285	260	208	296	182
Total Alkalinity as CaCO3	----	1	mg/L		285	260	208	296	182
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		81	53	68	36	25
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		72	57	42	48	16
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		111	99	86	85	52
Magnesium	7439-95-4	1	mg/L		17	11	16	12	10
Sodium	7440-23-5	1	mg/L		42	36	28	31	10
Potassium	7440-09-7	1	mg/L		5	4	5	3	1
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		9.41	7.91	6.76	8.02	4.61
ø Total Cations	----	0.01	meq/L		8.89	7.51	6.95	6.65	3.88
ø Ionic Balance	----	0.01	%		2.83	2.54	1.44	9.29	8.60
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.16	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.09	4.45	0.02	0.11	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.14	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	0.10	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	0.15	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	0.04	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_230315	0089_MW240_230315	0089_MW238_230315	0089_MW239_230315	0089_MW242_230315
				Sampling date / time	15-Mar-2023 09:51	15-Mar-2023 10:03	15-Mar-2023 10:13	15-Mar-2023 10:25	15-Mar-2023 10:44
Compound	CAS Number	LOR	Unit		EP2303198-006	EP2303198-007	EP2303198-008	EP2303198-009	EP2303198-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.19**	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_230315	0089_MW240_230315	0089_MW238_230315	0089_MW239_230315	0089_MW242_230315
				Sampling date / time	15-Mar-2023 09:51	15-Mar-2023 10:03	15-Mar-2023 10:13	15-Mar-2023 10:25	15-Mar-2023 10:44
Compound	CAS Number	LOR	Unit		EP2303198-006	EP2303198-007	EP2303198-008	EP2303198-009	EP2303198-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.09**	**5.15**	**0.02**	**0.21**	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.09**	**4.45**	**0.02**	**0.21**	**0.02**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.09**	**4.85**	**0.02**	**0.21**	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**115**	**107**	**115**	**101**
13C8-PFOA	----	0.02	%		**91.4**	**87.1**	**87.3**	**88.5**	**96.2**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_230315	0089_MW268_230315	----	----	----
				Sampling date / time	15-Mar-2023 11:28	15-Mar-2023 11:26	----	----	----
Compound	CAS Number	LOR	Unit		EP2303198-011	EP2303198-012	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**392**	**460**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**392**	**460**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**122**	**694**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**272**	**1930**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**74**	**174**	----	----	----
Magnesium	7439-95-4	1	mg/L		**56**	**214**	----	----	----
Sodium	7440-23-5	1	mg/L		**164**	**1060**	----	----	----
Potassium	7440-09-7	1	mg/L		**12**	**55**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**18.0**	**78.1**	----	----	----
ø Total Cations	----	0.01	meq/L		**15.7**	**73.8**	----	----	----
ø Ionic Balance	----	0.01	%		**6.82**	**2.81**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.06**	**0.05**	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.08**	**0.05**	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.33**	**0.32**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.34**	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.02**	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.07**	**0.06**	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_230315	0089_MW268_230315	----	----	----
				Sampling date / time	15-Mar-2023 11:28	15-Mar-2023 11:26	----	----	----
Compound	CAS Number	LOR	Unit		EP2303198-011	EP2303198-012	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_230315	0089_MW268_230315	----	----	----
				Sampling date / time	15-Mar-2023 11:28	15-Mar-2023 11:26	----	----	----
Compound	CAS Number	LOR	Unit		EP2303198-011	EP2303198-012	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.90**	**0.48**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.67**	**0.32**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.82**	**0.43**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**118**	----	----	----
13C8-PFOA	----	0.02	%		**97.6**	**107**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303198**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49668	Issue Date	: 27-Mar-2023
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

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Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4943876)									
EP2303198-002	0089_MW282_230315	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	517	521	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	517	521	0.7	0% - 20%
EP2303198-012	0089_MW268_230315	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	460	459	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	460	459	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4937767)									
EP2303198-001	0089_MW217_230315	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	70	69	0.0	0% - 20%
EP2303198-011	0089_MW269_230315	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	122	123	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4937768)									
EP2303198-001	0089_MW217_230315	ED045G: Chloride	16887-00-6	1	mg/L	50	51	0.0	0% - 20%
EP2303198-011	0089_MW269_230315	ED045G: Chloride	16887-00-6	1	mg/L	272	270	1.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4937265)									
EP2303198-001	0089_MW217_230315	ED093F: Calcium	7440-70-2	1	mg/L	114	117	2.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	15	15	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	40	40	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	12	12	0.0	0% - 50%
EP2303198-011	0089_MW269_230315	ED093F: Calcium	7440-70-2	1	mg/L	74	77	4.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	56	57	2.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	164	167	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	12	12	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4944233)									
EP2303177-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.03	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2303178-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.19	0.20	0.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.16	0.17	8.8	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.12	0.12	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4946690)									
EP2303198-010	0089_MW242_230315	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.03	58.1	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4944233)									
EP2303177-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2303178-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.23	0.23	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	4.84	4.91	1.4	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	5.00	5.12	2.4	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.18	1.17	0.0	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4944233) - continued									
EP2303178-003	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.4	1.4	0.0	0% - 50%
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4946690)									
EP2303198-010	0089_MW242_230315	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4944233)									
EP2303177-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303178-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4946690)									
EP2303198-010	0089_MW242_230315	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4944233)									
EP2303177-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303178-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.91	0.85	7.5	0% - 50%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4946690)									
EP2303198-010	0089_MW242_230315	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4944233)									
EP2303177-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.03	40.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4944233) - continued									
EP2303177-001	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.03	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.03	40.0	No Limit
EP2303178-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	14.0	14.2	1.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.19	0.20	5.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	13.9	14.0	1.0	0% - 20%
EP231P: PFAS Sums (QC Lot: 4946690)									
EP2303198-010	0089_MW242_230315	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.03	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.03	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.03	40.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4943876)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	106	87.8	118
				<1	200 mg/L	108	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4937767)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4937768)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	106	88.6	113
				<1	1000 mg/L	102	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4937265)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	105	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4944233)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	88.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	80.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	82.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	85.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	117	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4946690)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	105	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	95.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	75.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	76.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	95.9	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	96.7	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944233)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	89.4	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944233) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	84.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	88.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	82.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	107	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4946690)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	76.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	75.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	78.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	79.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	83.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	76.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	87.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4944233)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	98.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	68.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	78.7	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	97.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	88.0	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	119	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4946690)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	80.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	84.9	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	104	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	83.8	68.3	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4946690) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	72.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	85.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	83.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4944233)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	99.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	97.9	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	104	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4946690)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	94.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	84.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	95.4	64.2	133
EP231P: PFAS Sums (QCLot: 4944233)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 4946690)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4937767)							
EP2303198-001	0089_MW217_230315	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	101	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4937768)							
EP2303198-001	0089_MW217_230315	ED045G: Chloride	16887-00-6	1000 mg/L	116	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4944233)							
EP2303177-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.9	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	86.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	84.0	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	94.1	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	97.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	92.3	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944233)							
EP2303177-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	91.2	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	82.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	86.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	86.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	89.2	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	88.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	79.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	86.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	86.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	77.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	95.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4944233)							
EP2303177-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	87.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	84.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	74.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	93.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	91.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	98.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	88.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4944233)							
EP2303177-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	100	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	90.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	76.4	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303198**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023
Site	: Stirling GW - MB	Issue Date	: 27-Mar-2023
Sampler	: [redacted]	No. of samples received	: 12
Order number	: pfas-omp/Stirling	No. of samples analysed	: 12

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	3	39	7.69	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	39	2.56	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation* ***Date extracted***	*Due for extraction*	*Evaluation*	*Analysis* ***Date analysed***	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW217_230315, 0089_MW282_230315, 0089_MW220_230315, 0089_MW224_230315, 0089_MW245_230315, 0089_MW243_230315, 0089_MW240_230315, 0089_MW238_230315, 0089_MW239_230315, 0089_MW242_230315, 0089_MW269_230315, 0089_MW268_230315	**15-Mar-2023**	**----**	----	----	**21-Mar-2023**	29-Mar-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW217_230315, 0089_MW282_230315, 0089_MW220_230315, 0089_MW224_230315, 0089_MW245_230315, 0089_MW243_230315, 0089_MW240_230315, 0089_MW238_230315, 0089_MW239_230315, 0089_MW242_230315, 0089_MW269_230315, 0089_MW268_230315	**15-Mar-2023**	**----**	----	----	**23-Mar-2023**	12-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW217_230315, 0089_MW282_230315, 0089_MW220_230315, 0089_MW224_230315, 0089_MW245_230315, 0089_MW243_230315, 0089_MW240_230315, 0089_MW238_230315, 0089_MW239_230315, 0089_MW242_230315, 0089_MW269_230315, 0089_MW268_230315	**15-Mar-2023**	**----**	----	----	**23-Mar-2023**	12-Apr-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW217_230315, 0089_MW220_230315, 0089_MW245_230315, 0089_MW240_230315, 0089_MW239_230315, 0089_MW269_230315, 0089_MW282_230315, 0089_MW224_230315, 0089_MW243_230315, 0089_MW238_230315, 0089_MW242_230315, 0089_MW268_230315	**15-Mar-2023**	**----**	----	----	**20-Mar-2023**	22-Mar-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_230315, 0089_MW220_230315, 0089_MW245_230315, 0089_MW240_230315, 0089_MW239_230315, 0089_MW282_230315, 0089_MW224_230315, 0089_MW243_230315, 0089_MW238_230315,	**15-Mar-2023**	**22-Mar-2023**	11-Sep-2023	✓	**24-Mar-2023**	11-Sep-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW242_230315, 0089_MW268_230315, 0089_MW269_230315,	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_230315, 0089_MW220_230315, 0089_MW245_230315, 0089_MW240_230315, 0089_MW239_230315, 0089_MW282_230315, 0089_MW224_230315, 0089_MW243_230315, 0089_MW238_230315,	**15-Mar-2023**	**22-Mar-2023**	11-Sep-2023	✓	**24-Mar-2023**	11-Sep-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW242_230315, 0089_MW268_230315, 0089_MW269_230315,	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW217_230315, 0089_MW220_230315, 0089_MW245_230315, 0089_MW240_230315, 0089_MW239_230315, 0089_MW282_230315, 0089_MW224_230315, 0089_MW243_230315, 0089_MW238_230315,	**15-Mar-2023**	**22-Mar-2023**	11-Sep-2023	✓	**24-Mar-2023**	11-Sep-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW242_230315, 0089_MW268_230315, 0089_MW269_230315,	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_230315, 0089_MW282_230315, 0089_MW220_230315, 0089_MW224_230315, 0089_MW245_230315, 0089_MW243_230315, 0089_MW240_230315, 0089_MW238_230315, 0089_MW239_230315	**15-Mar-2023**	**22-Mar-2023**	11-Sep-2023	✓	**24-Mar-2023**	11-Sep-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW242_230315, 0089_MW269_230315, 0089_MW268_230315	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW217_230315, 0089_MW282_230315, 0089_MW220_230315, 0089_MW224_230315, 0089_MW245_230315, 0089_MW243_230315, 0089_MW240_230315, 0089_MW238_230315, 0089_MW239_230315	**15-Mar-2023**	**22-Mar-2023**	11-Sep-2023	✓	**24-Mar-2023**	11-Sep-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW242_230315, 0089_MW269_230315, 0089_MW268_230315	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	39	**7.69**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	39	**2.56**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2303226

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]
Phone: ( )

ALS Compass COC Reference: #49700, #49705, #49669, #49702, #49703 **# Samples:** **Sampler:**
Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 16/3/23 ~2:00	Date / Time: 16/3 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 49700 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW139		15/03/2023 09:04 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_MW141		15/03/2023 09:18 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW147		15/03/2023 09:34 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW142		15/03/2023 10:08 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW149		15/03/2023 10:22 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 49700 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW139	Clear Plastic Bottle - Natural	125 mL	00070522189367	Green	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00350821008494	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00350821008344	Grey	No	
002	0089_MW141	Clear Plastic Bottle - Natural	125 mL	00070522189246	Green	No	
002	0089_MW141	HDPE (no PTFE)	20 mL	00350522039225	Grey	No	
002	0089_MW141	HDPE (no PTFE)	20 mL	00350522039043	Grey	No	
003	0089_MW147	Clear Plastic Bottle - Natural	125 mL	00070522189242	Green	No	
003	0089_MW147	HDPE (no PTFE)	20 mL	00350522039145	Grey	No	
003	0089_MW147	HDPE (no PTFE)	20 mL	00350522039076	Grey	No	
004	0089_MW142	Clear Plastic Bottle - Natural	125 mL	00070522171491	Green	No	
004	0089_MW142	HDPE (no PTFE)	20 mL	00350522039123	Grey	No	
004	0089_MW142	HDPE (no PTFE)	20 mL	00350522039139	Grey	No	
005	0089_MW149	Clear Plastic Bottle - Natural	125 mL	00070522189292	Green	No	
005	0089_MW149	HDPE (no PTFE)	20 mL	00350821008516	Grey	No	
005	0089_MW149	HDPE (no PTFE)	20 mL	00350821008520	Grey	No	

Total Bottle Count: ALS: 15, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EP2303226**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49700	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 16-Mar-2023 12:00	Issue Date	: 16-Mar-2023
Client Requested Due Date	: 23-Mar-2023	Scheduled Reporting Date	: **23-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2303226-001	15-Mar-2023 09:04	0089_MW139_230315	✓	✓
EP2303226-002	15-Mar-2023 09:18	0089_MW141_230315	✓	✓
EP2303226-003	15-Mar-2023 09:34	0089_MW147_230315	✓	✓
EP2303226-004	15-Mar-2023 10:08	0089_MW142_230315	✓	✓
EP2303226-005	15-Mar-2023 10:22	0089_MW149_230315	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303226**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49700	Issue Date	: 23-Mar-2023 17:01
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_230315	0089_MW141_230315	0089_MW147_230315	0089_MW142_230315	0089_MW149_230315
				Sampling date / time	15-Mar-2023 09:04	15-Mar-2023 09:18	15-Mar-2023 09:34	15-Mar-2023 10:08	15-Mar-2023 10:22
Compound	CAS Number	LOR	Unit		EP2303226-001	EP2303226-002	EP2303226-003	EP2303226-004	EP2303226-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		228	599	454	376	200
Total Alkalinity as CaCO3	----	1	mg/L		228	599	454	376	200
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		141	836	1210	1510	2220
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1340	8340	9790	10500	15200
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		125	394	336	367	366
Magnesium	7439-95-4	1	mg/L		90	612	699	807	1130
Sodium	7440-23-5	1	mg/L		691	4840	5620	6600	9420
Potassium	7440-09-7	1	mg/L		32	174	238	302	479
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		45.3	265	310	335	479
ø Total Cations	----	0.01	meq/L		44.5	285	325	380	533
ø Ionic Balance	----	0.01	%		0.86	3.71	2.27	6.21	5.36
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.47	<0.02	0.14	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.91	<0.02	0.26	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	19.1	0.08	4.45	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	1.32	<0.02	0.14	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	72.5	0.02	3.07	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	0.3	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	1.20	<0.02	0.32	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	12.2	<0.02	3.31	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	0.34	<0.02	0.08	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_230315	0089_MW141_230315	0089_MW147_230315	0089_MW142_230315	0089_MW149_230315
				Sampling date / time	15-Mar-2023 09:04	15-Mar-2023 09:18	15-Mar-2023 09:34	15-Mar-2023 10:08	15-Mar-2023 10:22
Compound	CAS Number	LOR	Unit		EP2303226-001	EP2303226-002	EP2303226-003	EP2303226-004	EP2303226-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**1.43**	<0.01	**0.29**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.02**	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	**0.02**	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_230315	0089_MW141_230315	0089_MW147_230315	0089_MW142_230315	0089_MW149_230315
				Sampling date / time	15-Mar-2023 09:04	15-Mar-2023 09:18	15-Mar-2023 09:34	15-Mar-2023 10:08	15-Mar-2023 10:22
Compound	CAS Number	LOR	Unit		EP2303226-001	EP2303226-002	EP2303226-003	EP2303226-004	EP2303226-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**110**	**0.10**	**12.1**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**91.6**	**0.10**	**7.52**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**108**	**0.10**	**11.7**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.5**	**89.5**	**96.6**	**101**	**101**
13C8-PFOA	----	0.02	%		**81.2**	**85.9**	**82.8**	**84.8**	**95.0**

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303226**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49700	Issue Date	: 23-Mar-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4943562)									
EP2303179-015	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	133	130	2.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	133	130	2.1	0% - 20%
EP2303221-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	174	177	1.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	174	177	1.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4937762)									
EP2303178-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	102	100	2.4	0% - 20%
EP2303227-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2780	2860	2.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4937763)									
EP2303178-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	122	120	0.9	0% - 20%
EP2303227-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19400	19300	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4937265)									
EP2303198-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	114	117	2.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	15	15	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	40	40	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	12	12	0.0	0% - 50%
EP2303198-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	74	77	4.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	56	57	2.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	164	167	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	12	12	0.0	0% - 50%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4943562)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	104	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4937762)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.4	89.9	112
				<1	500 mg/L	97.6	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4937763)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100.0	88.6	113
				<1	1000 mg/L	99.0	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4937265)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	105	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4944223)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.9	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	87.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	77.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	87.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	85.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	95.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944223)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	82.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	80.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	83.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	84.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	85.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	80.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.2	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4944223) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	96.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4944223)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	73.1	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	66.9	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.9	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	79.3	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	89.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	81.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4944223)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	90.3	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	81.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	95.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	92.7	64.2	133
EP231P: PFAS Sums (QCLot: 4944223)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4937762)							
EP2303178-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	106	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4937763)							
EP2303178-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	99.5	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303226**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023
Site	: Stirling GW - CG	Issue Date	: 23-Mar-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 5
Order number	: pfas-omp/Stirling	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	5	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	5	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW139_230315, 0089_MW141_230315, 0089_MW147_230315, 0089_MW142_230315, 0089_MW149_230315	**15-Mar-2023**	**----**	----	----	**22-Mar-2023**	29-Mar-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW139_230315, 0089_MW141_230315, 0089_MW147_230315, 0089_MW142_230315, 0089_MW149_230315	**15-Mar-2023**	**----**	----	----	**23-Mar-2023**	12-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW139_230315, 0089_MW141_230315, 0089_MW147_230315, 0089_MW142_230315, 0089_MW149_230315	**15-Mar-2023**	**----**	----	----	**23-Mar-2023**	12-Apr-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW139_230315, 0089_MW141_230315, 0089_MW147_230315, 0089_MW142_230315, 0089_MW149_230315	**15-Mar-2023**	**----**	----	----	**20-Mar-2023**	22-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_230315, 0089_MW141_230315, 0089_MW147_230315, 0089_MW142_230315, 0089_MW149_230315	**15-Mar-2023**	**22-Mar-2023**	11-Sep-2023	✓	**23-Mar-2023**	11-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_230315, 0089_MW141_230315, 0089_MW147_230315, 0089_MW142_230315, 0089_MW149_230315	**15-Mar-2023**	**22-Mar-2023**	11-Sep-2023	✓	**23-Mar-2023**	11-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW139_230315, 0089_MW141_230315, 0089_MW147_230315, 0089_MW142_230315, 0089_MW149_230315	**15-Mar-2023**	**22-Mar-2023**	11-Sep-2023	✓	**23-Mar-2023**	11-Sep-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_230315, 0089_MW141_230315, 0089_MW147_230315, 0089_MW142_230315, 0089_MW149_230315	**15-Mar-2023**	**22-Mar-2023**	11-Sep-2023	✓	**23-Mar-2023**	11-Sep-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW139_230315, 0089_MW141_230315, 0089_MW147_230315, 0089_MW142_230315, 0089_MW149_230315	**15-Mar-2023**	**22-Mar-2023**	11-Sep-2023	✓	**23-Mar-2023**	11-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	5	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	5	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2303227

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]
Phone: ( )

ALS Compass COC Reference: **# Samples:** **Sampler:**
#49700, #49705, #49669, #49702, #49703
Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 15/3/23 2:00	Date / Time: 16/3 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 49702 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW356		15/03/2023 09:04 AM	WATER	ALS: 5 Non ALS: 0	No		X		
002	0089_PW331		15/03/2023 09:13 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_SW150		15/03/2023 09:21 AM	WATER	ALS: 5 Non ALS: 0	No		X		
004	0089_SW152		15/03/2023 09:30 AM	WATER	ALS: 5 Non ALS: 0	No		X		
005	0089_PW357		15/03/2023 09:39 AM	WATER	ALS: 3 Non ALS: 0	No		X		
006	0089_SW154		15/03/2023 09:46 AM	WATER	ALS: 5 Non ALS: 0	No		X		
007	0089_PW330		15/03/2023 09:53 AM	WATER	ALS: 3 Non ALS: 0	No		X		
008	0089_PW358		15/03/2023 10:04 AM	WATER	ALS: 3 Non ALS: 0	No		X		
009	0089_PW329		15/03/2023 10:12 AM	WATER	ALS: 3 Non ALS: 0	No		X		

CHAIN OF CUSTODY

(ALS) COC#: 49702 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SW156		15/03/2023 10:13 AM	WATER	ALS: 3 Non ALS: 0	No		X		
011	0089_QC301		15/03/2023 01:47 PM	WATER	ALS: 2 Non ALS: 0	No	X			
012	0089_QC302		15/03/2023 01:48 PM	WATER	ALS: 2 Non ALS: 0	No	X			
013	0089_QC303		15/03/2023 01:50 PM	WATER	ALS: 2 Non ALS: 0	No	X			
014	0089_QC401		15/03/2023 01:51 PM	WATER	ALS: 2 Non ALS: 0	No	X			
015	0089_QC402		15/03/2023 01:52 PM	WATER	ALS: 2 Non ALS: 0	No	X			
016	0089_QC403		15/03/2023 01:52 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

ALS COC#: 49702 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW356	Clear Plastic Bottle - Natural	125 mL	00070522189293	Green	No	
001	0089_PW356	HDPE (no PTFE)	20 mL	00350821008394	Grey	No	
001	0089_PW356	HDPE (no PTFE)	20 mL	00350821008371	Grey	No	
001	0089_PW356	HDPE (no PTFE)	20 mL	00350821008518	Grey	No	
001	0089_PW356	HDPE (no PTFE)	20 mL	00350821008334	Grey	No	
002	0089_PW331	Clear Plastic Bottle - Natural	125 mL	00070522171564	Green	No	
002	0089_PW331	HDPE (no PTFE)	20 mL	00350821008497	Grey	No	
002	0089_PW331	HDPE (no PTFE)	20 mL	00350821008269	Grey	No	
003	0089_SW150	Clear Plastic Bottle - Natural	125 mL	00070522189347	Green	No	
003	0089_SW150	HDPE (no PTFE)	20 mL	00350522039198	Grey	No	
003	0089_SW150	HDPE (no PTFE)	20 mL	00350522039115	Grey	No	
003	0089_SW150	HDPE (no PTFE)	20 mL	00350821008361	Grey	No	
003	0089_SW150	HDPE (no PTFE)	20 mL	00350821008305	Grey	No	
004	0089_SW152	Clear Plastic Bottle - Natural	125 mL	00070522189263	Green	No	
004	0089_SW152	HDPE (no PTFE)	20 mL	00350821008422	Grey	No	
004	0089_SW152	HDPE (no PTFE)	20 mL	00350821008283	Grey	No	
004	0089_SW152	HDPE (no PTFE)	20 mL	00350821008449	Grey	No	
004	0089_SW152	HDPE (no PTFE)	20 mL	00350821008441	Grey	No	
005	0089_PW357	Clear Plastic Bottle - Natural	125 mL	00070522189361	Green	No	
005	0089_PW357	HDPE (no PTFE)	20 mL	00350821008451	Grey	No	
005	0089_PW357	HDPE (no PTFE)	20 mL	00350821008290	Grey	No	
006	0089_SW154	HDPE (no PTFE)	20 mL	00350821008349	Grey	No	
006	0089_SW154	HDPE (no PTFE)	20 mL	00350821008556	Grey	No	
006	0089_SW154	HDPE (no PTFE)	20 mL	00350621000510	Grey	No	
006	0089_SW154	HDPE (no PTFE)	20 mL	00350621000447	Grey	No	
006	0089_SW154	Clear Plastic Bottle - Natural	125 mL	00070522171569	Green	No	

CHAIN OF CUSTODY

ALS COC#: 49702 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

007	0089_PW330	Clear Plastic Bottle - Natural	125 mL	00070522171552	Green	No	
007	0089_PW330	HDPE (no PTFE)	20 mL	00350821008359	Grey	No	
007	0089_PW330	HDPE (no PTFE)	20 mL	00350821008321	Grey	No	
008	0089_PW358	HDPE (no PTFE)	20 mL	00350821008363	Grey	No	
008	0089_PW358	HDPE (no PTFE)	20 mL	00350821008326	Grey	No	
008	0089_PW358	Clear Plastic Bottle - Natural	125 mL	00070522171576	Green	No	
009	0089_PW329	Clear Plastic Bottle - Natural	125 mL	00070522171550	Green	No	
009	0089_PW329	HDPE (no PTFE)	20 mL	00350821008399	Grey	No	
009	0089_PW329	HDPE (no PTFE)	20 mL	00350821008492	Grey	No	
010	0089_SW156	HDPE (no PTFE)	20 mL	00350821008417	Grey	No	
010	0089_SW156	Clear Plastic Bottle - Natural	125 mL	00070522169302	Green	No	
010	0089_SW156	HDPE (no PTFE)	20 mL	00350821008426	Grey	No	
011	0089_QC301	HDPE (no PTFE)	20 mL	00350821008284	Grey	No	
011	0089_QC301	HDPE (no PTFE)	20 mL	00350821008412	Grey	No	
012	0089_QC302	HDPE (no PTFE)	20 mL	00350821008335	Grey	No	
012	0089_QC302	HDPE (no PTFE)	20 mL	00350821008351	Grey	No	
013	0089_QC303	HDPE (no PTFE)	20 mL	00350821008472	Grey	No	
013	0089_QC303	HDPE (no PTFE)	20 mL	00350821008538	Grey	No	
014	0089_QC401	HDPE (no PTFE)	20 mL	00350821008434	Grey	No	
014	0089_QC401	HDPE (no PTFE)	20 mL	00350821008539	Grey	No	
015	0089_QC402	HDPE (no PTFE)	20 mL	00350821008337	Grey	No	
015	0089_QC402	HDPE (no PTFE)	20 mL	00350821008533	Grey	No	
016	0089_QC403	HDPE (no PTFE)	20 mL	00350821008482	Grey	No	
016	0089_QC403	HDPE (no PTFE)	20 mL	00350821008548	Grey	No	

Total Bottle Count: ALS: 50, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2303227**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49702	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 16-Mar-2023 12:00	Issue Date	: 17-Mar-2023
Client Requested Due Date	: 27-Mar-2023	Scheduled Reporting Date	: **27-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 16 / 16

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2303227-001	15-Mar-2023 09:04	0089_PW356_230315	✓	✓
EP2303227-002	15-Mar-2023 09:13	0089_PW331_230315	✓	✓
EP2303227-003	15-Mar-2023 09:21	0089_SW150_230315	✓	✓
EP2303227-004	15-Mar-2023 09:30	0089_SW152_230315	✓	✓
EP2303227-005	15-Mar-2023 09:39	0089_PW357_230315	✓	✓
EP2303227-006	15-Mar-2023 09:46	0089_SW154_230315	✓	✓
EP2303227-007	15-Mar-2023 09:53	0089_PW330_230315	✓	✓
EP2303227-008	15-Mar-2023 10:04	0089_PW358_230315	✓	✓
EP2303227-009	15-Mar-2023 10:12	0089_PW329_230315	✓	✓
EP2303227-010	15-Mar-2023 10:13	0089_SW156_230315	✓	✓
EP2303227-011	15-Mar-2023 13:47	0089_QC301_230315	✓	
EP2303227-012	15-Mar-2023 13:48	0089_QC302_230315	✓	
EP2303227-013	15-Mar-2023 13:50	0089_QC303_230315	✓	
EP2303227-014	15-Mar-2023 13:51	0089_QC401_230315	✓	
EP2303227-015	15-Mar-2023 13:52	0089_QC402_230315	✓	
EP2303227-016	15-Mar-2023 13:52	0089_QC403_230315	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303227**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49702	Issue Date	: 27-Mar-2023 15:11
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC301_230315	0089_QC302_230315	0089_QC303_230315	0089_QC401_230315	0089_QC402_230315
				Sampling date / time	15-Mar-2023 13:47	15-Mar-2023 13:48	15-Mar-2023 13:50	15-Mar-2023 13:51	15-Mar-2023 13:52
					EP2303227-011	EP2303227-012	EP2303227-013	EP2303227-014	EP2303227-015
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_230315	0089_QC302_230315	0089_QC303_230315	0089_QC401_230315	0089_QC402_230315
				Sampling date / time	15-Mar-2023 13:47	15-Mar-2023 13:48	15-Mar-2023 13:50	15-Mar-2023 13:51	15-Mar-2023 13:52
Compound	CAS Number	LOR	Unit		EP2303227-011	EP2303227-012	EP2303227-013	EP2303227-014	EP2303227-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.5**	**94.6**	**93.9**	**96.7**	**95.2**
13C8-PFOA	----	0.02	%		**95.0**	**91.2**	**93.4**	**89.8**	**94.9**

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	**0089_QC403_230315**	----	----	----	----
				Sampling date / time	15-Mar-2023 13:52	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2303227-016**	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_230315	----	----	----	----
				Sampling date / time	15-Mar-2023 13:52	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2303227-016	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.4**	----	----	----	----
13C8-PFOA	----	0.02	%		**93.3**	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_230315	0089_PW331_230315	0089_SW150_230315	0089_SW152_230315	0089_PW357_230315
				Sampling date / time	15-Mar-2023 09:04	15-Mar-2023 09:13	15-Mar-2023 09:21	15-Mar-2023 09:30	15-Mar-2023 09:39
Compound	CAS Number	LOR	Unit		EP2303227-001	EP2303227-002	EP2303227-003	EP2303227-004	EP2303227-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		158	152	125	126	138
Total Alkalinity as CaCO3	----	1	mg/L		158	152	125	126	138
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2780	2810	2780	2820	2840
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19400	23300	19300	19400	19500
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		485	497	471	443	457
Magnesium	7439-95-4	1	mg/L		1480	1530	1490	1420	1430
Sodium	7440-23-5	1	mg/L		11700	12000	11800	11500	11700
Potassium	7440-09-7	1	mg/L		550	568	549	531	537
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		608	719	605	608	612
ø Total Cations	----	0.01	meq/L		669	687	673	653	663
ø Ionic Balance	----	0.01	%		4.75	2.25	5.37	3.51	4.01
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_230315	0089_PW331_230315	0089_SW150_230315	0089_SW152_230315	0089_PW357_230315
				Sampling date / time	15-Mar-2023 09:04	15-Mar-2023 09:13	15-Mar-2023 09:21	15-Mar-2023 09:30	15-Mar-2023 09:39
Compound	CAS Number	LOR	Unit		EP2303227-001	EP2303227-002	EP2303227-003	EP2303227-004	EP2303227-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_230315	0089_PW331_230315	0089_SW150_230315	0089_SW152_230315	0089_PW357_230315
				Sampling date / time	15-Mar-2023 09:04	15-Mar-2023 09:13	15-Mar-2023 09:21	15-Mar-2023 09:30	15-Mar-2023 09:39
Compound	CAS Number	LOR	Unit		EP2303227-001	EP2303227-002	EP2303227-003	EP2303227-004	EP2303227-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.8**	**100**	**104**	**109**	**89.3**
13C8-PFOA	----	0.02	%		**97.1**	**93.3**	**95.1**	**92.9**	**88.4**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW154_230315	0089_PW330_230315	0089_PW358_230315	0089_PW329_230315	0089_SW156_230315
				Sampling date / time	15-Mar-2023 09:46	15-Mar-2023 09:53	15-Mar-2023 10:04	15-Mar-2023 10:12	15-Mar-2023 10:13
Compound	CAS Number	LOR	Unit		EP2303227-006	EP2303227-007	EP2303227-008	EP2303227-009	EP2303227-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		124	134	133	133	128
Total Alkalinity as CaCO3	----	1	mg/L		124	134	133	133	128
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2770	2820	2760	2850	2760
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19200	18900	19000	19600	19900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		456	463	452	462	458
Magnesium	7439-95-4	1	mg/L		1450	1460	1440	1460	1470
Sodium	7440-23-5	1	mg/L		11800	12000	11800	11900	12000
Potassium	7440-09-7	1	mg/L		550	547	541	556	550
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		602	594	596	615	621
ø Total Cations	----	0.01	meq/L		669	679	668	675	680
ø Ionic Balance	----	0.01	%		5.32	6.65	5.70	4.66	4.50
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW154_230315	0089_PW330_230315	0089_PW358_230315	0089_PW329_230315	0089_SW156_230315
				Sampling date / time	15-Mar-2023 09:46	15-Mar-2023 09:53	15-Mar-2023 10:04	15-Mar-2023 10:12	15-Mar-2023 10:13
Compound	CAS Number	LOR	Unit		EP2303227-006	EP2303227-007	EP2303227-008	EP2303227-009	EP2303227-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_SW154_230315	0089_PW330_230315	0089_PW358_230315	0089_PW329_230315	0089_SW156_230315
			Sampling date / time	15-Mar-2023 09:46	15-Mar-2023 09:53	15-Mar-2023 10:04	15-Mar-2023 10:12	15-Mar-2023 10:13
Compound	CAS Number	LOR	Unit	EP2303227-006	EP2303227-007	EP2303227-008	EP2303227-009	EP2303227-010
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**94.3**	**101**	**96.1**	**95.1**	**91.2**
13C8-PFOA	----	0.02	%	**94.5**	**93.9**	**92.1**	**93.8**	**92.2**

Surrogate Control Limits

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303227**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49702	Issue Date	: 27-Mar-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4943876)									
EP2303198-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	517	521	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	517	521	0.7	0% - 20%
EP2303198-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	460	459	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	460	459	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4945234)									
EP2303227-009	0089_PW329_230315	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	133	133	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	133	133	0.0	0% - 20%
EP2303229-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	124	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4937762)									
EP2303178-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	102	100	2.4	0% - 20%
EP2303227-001	0089_PW356_230315	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2780	2860	2.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4937763)									
EP2303178-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	122	120	0.9	0% - 20%
EP2303227-001	0089_PW356_230315	ED045G: Chloride	16887-00-6	1	mg/L	19400	19300	0.4	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED093F: Dissolved Major Cations (QC Lot: 4937265)									
EP2303198-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	114	117	2.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	15	15	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	40	40	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	12	12	0.0	0% - 50%
EP2303198-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	74	77	4.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	56	57	2.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	164	167	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	12	12	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 4937266)									
EP2303227-004	0089_SW152_230315	ED093F: Calcium	7440-70-2	1	mg/L	443	446	0.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1420	1430	0.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11500	11700	1.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	531	536	1.0	0% - 20%
EP2303229-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	451	453	0.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1450	1450	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11800	11900	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	542	542	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4946691)									
EP2303227-001	0089_PW356_230315	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2303227-006	0089_SW154_230315	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4946691)									
EP2303227-001	0089_PW356_230315	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4946691) - continued									
EP2303227-001	0089_PW356_230315	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2303227-006	0089_SW154_230315	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4946691)									
EP2303227-001	0089_PW356_230315	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303227-006	0089_SW154_230315	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4946691)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4946691) - continued									
EP2303227-001	0089_PW356_230315	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2303227-006	0089_SW154_230315	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4946691)									
EP2303227-001	0089_PW356_230315	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2303227-006	0089_SW154_230315	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4943876)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	106	87.8	118
				<1	200 mg/L	108	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 4945234)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	97.4	87.8	118
				<1	200 mg/L	100	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4937762)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.4	89.9	112
				<1	500 mg/L	97.6	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4937763)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100.0	88.6	113
				<1	1000 mg/L	99.0	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4937265)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	105	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.2	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4937266)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	107	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	107	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4946691)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	87.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	86.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	72.1	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	78.2	69.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4946691) - continued								
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	79.5	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	104	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4946691)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	76.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	76.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	75.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	80.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	74.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	78.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	74.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	76.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	73.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	81.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4946691)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	78.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	68.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	77.1	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	73.9	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	75.0	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	81.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	74.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4946691)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	77.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	81.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	81.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	79.9	64.2	133
EP231P: PFAS Sums (QCLot: 4946691)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4937762)							
EP2303178-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	106	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4937763)							
EP2303178-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	99.5	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4946691)							
EP2303227-003	0089_SW150_230315	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	85.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	91.6	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	75.3	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	79.9	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	76.3	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	100	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4946691)							
EP2303227-003	0089_SW150_230315	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	78.3	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	73.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	78.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	93.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	77.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	80.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	73.0	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	80.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	73.4	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	81.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	90.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4946691)							
EP2303227-003	0089_SW150_230315	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	76.0	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	73.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	77.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	78.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	78.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	86.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	76.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4946691)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4946691) - continued							
EP2303227-003	0089_SW150_230315	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	80.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	86.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	82.5	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	74.8	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303227**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023
Site	: Stirling SW/PW - JS	Issue Date	: 27-Mar-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 16
Order number	: pfas-omp/Stirling	No. of samples analysed	: 16

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW356_230315,	0089_PW331_230315,	**15-Mar-2023**	**----**	----	----	**21-Mar-2023**	29-Mar-2023	✓
0089_SW150_230315,	0089_SW152_230315,							
0089_PW357_230315,	0089_SW154_230315,							
0089_PW330_230315,	0089_PW358_230315							
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW329_230315,	0089_SW156_230315	**15-Mar-2023**	**----**	----	----	**22-Mar-2023**	29-Mar-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_PW356_230315,	0089_PW331_230315,	**15-Mar-2023**	**----**	----	----	**23-Mar-2023**	12-Apr-2023	✓
0089_SW150_230315,	0089_SW152_230315,							
0089_PW357_230315,	0089_SW154_230315,							
0089_PW330_230315,	0089_PW358_230315,							
0089_PW329_230315,	0089_SW156_230315							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_PW356_230315,	0089_PW331_230315,	**15-Mar-2023**	**----**	----	----	**23-Mar-2023**	12-Apr-2023	✓
0089_SW150_230315,	0089_SW152_230315,							
0089_PW357_230315,	0089_SW154_230315,							
0089_PW330_230315,	0089_PW358_230315,							
0089_PW329_230315,	0089_SW156_230315							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_PW356_230315,	0089_PW331_230315,	**15-Mar-2023**	**----**	----	----	**20-Mar-2023**	22-Mar-2023	✓
0089_SW150_230315,	0089_SW152_230315,							
0089_PW357_230315,	0089_SW154_230315,							
0089_PW330_230315,	0089_PW358_230315,							
0089_PW329_230315,	0089_SW156_230315							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW356_230315,	0089_PW331_230315,	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓
0089_SW150_230315,	0089_SW152_230315,							
0089_PW357_230315,	0089_SW154_230315,							
0089_PW330_230315,	0089_PW358_230315,							
0089_PW329_230315,	0089_SW156_230315,							
0089_QC301_230315,	0089_QC302_230315,							
0089_QC303_230315,	0089_QC401_230315,							
0089_QC402_230315,	0089_QC403_230315							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW356_230315,	0089_PW331_230315,	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓
0089_SW150_230315,	0089_SW152_230315,							
0089_PW357_230315,	0089_SW154_230315,							
0089_PW330_230315,	0089_PW358_230315,							
0089_PW329_230315,	0089_SW156_230315,							
0089_QC301_230315,	0089_QC302_230315,							
0089_QC303_230315,	0089_QC401_230315,							
0089_QC402_230315,	0089_QC403_230315							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_PW356_230315,	0089_PW331_230315,	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓
0089_SW150_230315,	0089_SW152_230315,							
0089_PW357_230315,	0089_SW154_230315,							
0089_PW330_230315,	0089_PW358_230315,							
0089_PW329_230315,	0089_SW156_230315,							
0089_QC301_230315,	0089_QC302_230315,							
0089_QC303_230315,	0089_QC401_230315,							
0089_QC402_230315,	0089_QC403_230315							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW356_230315,	0089_PW331_230315,	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓
0089_SW150_230315,	0089_SW152_230315,							
0089_PW357_230315,	0089_SW154_230315,							
0089_PW330_230315,	0089_PW358_230315,							
0089_PW329_230315,	0089_SW156_230315,							
0089_QC301_230315,	0089_QC302_230315,							
0089_QC303_230315,	0089_QC401_230315,							
0089_QC402_230315,	0089_QC403_230315							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_PW356_230315,	0089_PW331_230315,	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓
0089_SW150_230315,	0089_SW152_230315,							
0089_PW357_230315,	0089_SW154_230315,							
0089_PW330_230315,	0089_PW358_230315,							
0089_PW329_230315,	0089_SW156_230315,							
0089_QC301_230315,	0089_QC302_230315,							
0089_QC303_230315,	0089_QC401_230315,							
0089_QC402_230315,	0089_QC403_230315							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2303228

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]
Phone: ( )

ALS Compass COC Reference: **# Samples:** **Sampler:**
#49700, #49705, #49669, #49702, #49703
Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 16/3/23 2:00	Date / Time: 16/3 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 49703 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD356		15/03/2023 09:02 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD331		15/03/2023 09:13 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD357		15/03/2023 09:40 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD330		15/03/2023 09:53 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD358		15/03/2023 10:05 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD329		15/03/2023 10:14 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD350		15/03/2023 10:33 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
008	0089_SD401		15/03/2023 10:33 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
009	0089_SD380		15/03/2023 10:33 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 49703 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SD351		15/03/2023 10:34 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
011	0089_SD381		15/03/2023 10:34 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
012	0089_SD352		15/03/2023 10:35 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
013	0089_SD415		15/03/2023 01:06 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
014	0089_SD413		15/03/2023 01:07 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
015	0089_SD411		15/03/2023 01:07 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 49703 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD356	HDPE Soil Jar	200 mL	00621122022814	Grey	No	
002	0089_SD331	HDPE Soil Jar	200 mL	00621122022764	Grey	No	
003	0089_SD357	HDPE Soil Jar	200 mL	00621122022805	Grey	No	
004	0089_SD330	HDPE Soil Jar	200 mL	00621122022778	Grey	No	
005	0089_SD358	HDPE Soil Jar	200 mL	00621122022762	Grey	No	
006	0089_SD329	HDPE Soil Jar	200 mL	00621122022809	Grey	No	
007	0089_SD350	HDPE Soil Jar	200 mL	00621122022845	Grey	No	
008	0089_SD401	HDPE Soil Jar	200 mL	00621122022828	Grey	No	
009	0089_SD380	HDPE Soil Jar	200 mL	00621122022784	Grey	No	
010	0089_SD351	HDPE Soil Jar	200 mL	00621122022766	Grey	No	
011	0089_SD381	HDPE Soil Jar	200 mL	00621122022754	Grey	No	
012	0089_SD352	HDPE Soil Jar	200 mL	00621122022773	Grey	No	
013	0089_SD415	HDPE Soil Jar	200 mL	00621122022803	Grey	No	
014	0089_SD413	HDPE Soil Jar	200 mL	00621122022840	Grey	No	
015	0089_SD411	HDPE Soil Jar	200 mL	00621122022807	Grey	No	

Total Bottle Count: ALS: 15, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2303228**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49703	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 16-Mar-2023 12:00	Issue Date	: 16-Mar-2023
Client Requested Due Date	: 23-Mar-2023	Scheduled Reporting Date	: **23-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 15 / 15

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2303228-001	15-Mar-2023 09:02	0089_SD356_230315	✓	✓
EP2303228-002	15-Mar-2023 09:13	0089_SD331_230315	✓	✓
EP2303228-003	15-Mar-2023 09:40	0089_SD357_230315	✓	✓
EP2303228-004	15-Mar-2023 09:53	0089_SD330_230315	✓	✓
EP2303228-005	15-Mar-2023 10:05	0089_SD358_230315	✓	✓
EP2303228-006	15-Mar-2023 10:14	0089_SD329_230315	✓	✓
EP2303228-007	15-Mar-2023 10:33	0089_SD350_230315	✓	✓
EP2303228-008	15-Mar-2023 10:33	0089_SD401_230315	✓	✓
EP2303228-009	15-Mar-2023 10:33	0089_SD380_230315	✓	✓
EP2303228-010	15-Mar-2023 10:34	0089_SD351_230315	✓	✓
EP2303228-011	15-Mar-2023 10:34	0089_SD381_230315	✓	✓
EP2303228-012	15-Mar-2023 10:35	0089_SD352_230315	✓	✓
EP2303228-013	15-Mar-2023 13:06	0089_SD415_230315	✓	✓
EP2303228-014	15-Mar-2023 13:07	0089_SD413_230315	✓	✓
EP2303228-015	15-Mar-2023 13:07	0089_SD411_230315	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303228**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49703	Issue Date	: 23-Mar-2023 15:32
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD356_230315	0089_SD331_230315	0089_SD357_230315	0089_SD330_230315	0089_SD358_230315
				Sampling date / time	15-Mar-2023 09:02	15-Mar-2023 09:13	15-Mar-2023 09:40	15-Mar-2023 09:53	15-Mar-2023 10:05
					EP2303228-001	EP2303228-002	EP2303228-003	EP2303228-004	EP2303228-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**22.4**	**26.7**	**27.0**	**21.2**	**22.6**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD356_230315	0089_SD331_230315	0089_SD357_230315	0089_SD330_230315	0089_SD358_230315
				Sampling date / time	15-Mar-2023 09:02	15-Mar-2023 09:13	15-Mar-2023 09:40	15-Mar-2023 09:53	15-Mar-2023 10:05
Compound	CAS Number	LOR	Unit		EP2303228-001	EP2303228-002	EP2303228-003	EP2303228-004	EP2303228-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		110	128	115	118	120
13C8-PFOA	----	0.0002	%		102	100	92.5	102	100

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD329_230315	0089_SD350_230315	0089_SD401_230315	0089_SD380_230315	0089_SD351_230315
				Sampling date / time	15-Mar-2023 10:14	15-Mar-2023 10:33	15-Mar-2023 10:33	15-Mar-2023 10:33	15-Mar-2023 10:34
					EP2303228-006	EP2303228-007	EP2303228-008	EP2303228-009	EP2303228-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**19.7**	**20.6**	**20.8**	**22.1**	**24.0**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD329_230315	0089_SD350_230315	0089_SD401_230315	0089_SD380_230315	0089_SD351_230315
				Sampling date / time	15-Mar-2023 10:14	15-Mar-2023 10:33	15-Mar-2023 10:33	15-Mar-2023 10:33	15-Mar-2023 10:34
Compound	CAS Number	LOR	Unit		EP2303228-006	EP2303228-007	EP2303228-008	EP2303228-009	EP2303228-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**114**	**115**	**116**	**114**	**108**
13C8-PFOA	----	0.0002	%		**102**	**96.5**	**100**	**104**	**100**

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD381_230315	0089_SD352_230315	0089_SD415_230315	0089_SD413_230315	0089_SD411_230315
				Sampling date / time	15-Mar-2023 10:34	15-Mar-2023 10:35	15-Mar-2023 13:06	15-Mar-2023 13:07	15-Mar-2023 13:07
					EP2303228-011	EP2303228-012	EP2303228-013	EP2303228-014	EP2303228-015
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**20.2**	**18.4**	**22.8**	**23.8**	**25.3**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD381_230315	0089_SD352_230315	0089_SD415_230315	0089_SD413_230315	0089_SD411_230315
				Sampling date / time	15-Mar-2023 10:34	15-Mar-2023 10:35	15-Mar-2023 13:06	15-Mar-2023 13:07	15-Mar-2023 13:07
Compound	CAS Number	LOR	Unit		EP2303228-011	EP2303228-012	EP2303228-013	EP2303228-014	EP2303228-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**109**	**113**	**112**	**107**	**106**
13C8-PFOA	----	0.0002	%		**92.0**	**99.5**	**94.5**	**93.0**	**90.5**

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303228**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49703	Issue Date	: 23-Mar-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4942033)									
EP2303228-001	0089_SD356_230315	EA055: Moisture Content	----	0.1	%	22.4	22.8	1.5	0% - 20%
EP2303228-010	0089_SD351_230315	EA055: Moisture Content	----	0.1	%	24.0	23.9	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4937631)									
EP2303087-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2303087-011	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4937632)									
EP2303176-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0004	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2303180-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4937632) - continued									
EP2303180-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4937631)									
EP2303087-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2303087-011	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4937632)									
EP2303176-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2303180-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4937632) - continued									
EP2303180-002	Anonymous	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4937631)									
EP2303087-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2303087-011	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4937632)									
EP2303176-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4937632) - continued									
EP2303176-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2303180-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4937631)									
EP2303087-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2303087-011	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4937632)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4937632) - continued									
EP2303176-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2303180-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4937631)									
EP2303087-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2303087-011	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4937632)									
EP2303176-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
EP2303180-002	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937631)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	102	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	89.4	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	100	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	91.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	92.9	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937632)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	110	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	84.3	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	96.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	90.1	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	94.6	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937631)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	95.5	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	100	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937632)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	99.3	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	64.0	136

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937632) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	104	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937631)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	87.7	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.0	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.8	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937632)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	130	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.5	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	80.6	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.1	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.9	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937631)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	97.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	95.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	108	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	105	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937632)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	107	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	122	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	95.0	54.8	124
EP231P: PFAS Sums (QCLot: 4937631)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 4937631) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 4937632)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937631)							
EP2303087-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	95.5	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	84.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	89.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	100	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	98.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	97.7	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4937632)							
EP2303176-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	102	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	94.9	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	82.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	98.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	91.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	89.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937631)							
EP2303087-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	96.8	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	91.7	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.1	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	92.1	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	94.8	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	97.7	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	94.8	69.0	133

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937631) - continued							
EP2303087-002	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	90.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	96.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	92.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	97.6	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4937632)							
EP2303176-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	98.3	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	87.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	88.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	94.3	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	94.4	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	100	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	100	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	101	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	91.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	86.3	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	101	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937631)							
EP2303087-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	97.7	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	88.3	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	91.3	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	99.4	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	112	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	100	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937632)							
EP2303176-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	121	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	85.9	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	89.7	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	95.4	60.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4937632) - continued							
EP2303176-002	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	116	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	110	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937631)							
EP2303087-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	98.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	94.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	116	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	106	60.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4937632)							
EP2303176-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	106	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	102	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	121	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	95.7	60.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303228**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023
Site	: Stirling SD - JS	Issue Date	: 23-Mar-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 15
Order number	: pfas-omp/Stirling	No. of samples analysed	: 15

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD356_230315, 0089_SD331_230315, 0089_SD357_230315, 0089_SD330_230315, 0089_SD358_230315, 0089_SD329_230315, 0089_SD350_230315, 0089_SD401_230315, 0089_SD380_230315, 0089_SD351_230315, 0089_SD381_230315, 0089_SD352_230315, 0089_SD415_230315, 0089_SD413_230315, 0089_SD411_230315	**15-Mar-2023**	**----**	----	----	**21-Mar-2023**	29-Mar-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_230315, 0089_SD331_230315, 0089_SD357_230315, 0089_SD330_230315, 0089_SD358_230315, 0089_SD329_230315, 0089_SD350_230315, 0089_SD401_230315, 0089_SD380_230315, 0089_SD351_230315, 0089_SD381_230315, 0089_SD352_230315, 0089_SD415_230315, 0089_SD413_230315, 0089_SD411_230315	**15-Mar-2023**	**17-Mar-2023**	11-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_230315, 0089_SD331_230315, 0089_SD357_230315, 0089_SD330_230315, 0089_SD358_230315, 0089_SD329_230315, 0089_SD350_230315, 0089_SD401_230315, 0089_SD380_230315, 0089_SD351_230315, 0089_SD381_230315, 0089_SD352_230315, 0089_SD415_230315, 0089_SD413_230315, 0089_SD411_230315	**15-Mar-2023**	**17-Mar-2023**	11-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD356_230315, 0089_SD331_230315, 0089_SD357_230315, 0089_SD330_230315, 0089_SD358_230315, 0089_SD329_230315, 0089_SD350_230315, 0089_SD401_230315, 0089_SD380_230315, 0089_SD351_230315, 0089_SD381_230315, 0089_SD352_230315, 0089_SD415_230315, 0089_SD413_230315, 0089_SD411_230315	**15-Mar-2023**	**17-Mar-2023**	11-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_230315, 0089_SD331_230315, 0089_SD357_230315, 0089_SD330_230315, 0089_SD358_230315, 0089_SD329_230315, 0089_SD350_230315, 0089_SD401_230315, 0089_SD380_230315, 0089_SD351_230315, 0089_SD381_230315, 0089_SD352_230315, 0089_SD415_230315, 0089_SD413_230315, 0089_SD411_230315	**15-Mar-2023**	**17-Mar-2023**	11-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD356_230315, 0089_SD331_230315, 0089_SD357_230315, 0089_SD330_230315, 0089_SD358_230315, 0089_SD329_230315, 0089_SD350_230315, 0089_SD401_230315, 0089_SD380_230315, 0089_SD351_230315, 0089_SD381_230315, 0089_SD352_230315, 0089_SD415_230315, 0089_SD413_230315, 0089_SD411_230315	**15-Mar-2023**	**17-Mar-2023**	11-Sep-2023	✓	**21-Mar-2023**	26-Apr-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

Perth
Work Order Reference
EP2303229

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]
Phone: ( )

ALS Compass COC Reference: #49700, #49705, #49669, #49702, #49703 **# Samples:** **Sampler:**
Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 15/3/23 2:00	Date / Time: 16/3 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 49705 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW353		15/03/2023 10:35 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_SW384		15/03/2023 10:37 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_SW382		15/03/2023 10:56 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_SW383		15/03/2023 10:57 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW352		15/03/2023 11:00 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_PW381		15/03/2023 11:00 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW351		15/03/2023 11:01 AM	WATER	ALS: 3 Non ALS: 0	No	X		
008	0089_PW380		15/03/2023 11:02 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_PW401		15/03/2023 11:03 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 49705 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SW350		15/03/2023 11:04 AM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_SW416		15/03/2023 01:05 PM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_SW414		15/03/2023 01:06 PM	WATER	ALS: 3 Non ALS: 0	No	X		
013	0089_SW412		15/03/2023 01:07 PM	WATER	ALS: 3 Non ALS: 0	No	X		
014	0089_PW411		15/03/2023 01:08 PM	WATER	ALS: 3 Non ALS: 0	No	X		
015	0089_PW415		15/03/2023 01:09 PM	WATER	ALS: 3 Non ALS: 0	No	X		
016	0089_PW413		15/03/2023 01:10 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 49705 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW353	Clear Plastic Bottle - Natural	125 mL	00070522189210	Green	No	
001	0089_SW353	HDPE (no PTFE)	20 mL	00350522039026	Grey	No	
001	0089_SW353	HDPE (no PTFE)	20 mL	00350522039056	Grey	No	
002	0089_SW384	Clear Plastic Bottle - Natural	125 mL	00070522171556	Green	No	
002	0089_SW384	HDPE (no PTFE)	20 mL	00350821008425	Grey	No	
002	0089_SW384	HDPE (no PTFE)	20 mL	00350821008315	Grey	No	
003	0089_SW382	Clear Plastic Bottle - Natural	125 mL	00070522189287	Green	No	
003	0089_SW382	HDPE (no PTFE)	20 mL	00350821008473	Grey	No	
003	0089_SW382	HDPE (no PTFE)	20 mL	00350821008517	Grey	No	
004	0089_SW383	Clear Plastic Bottle - Natural	125 mL	00070522189335	Green	No	
004	0089_SW383	HDPE (no PTFE)	20 mL	00350821008411	Grey	No	
004	0089_SW383	HDPE (no PTFE)	20 mL	00350821008440	Grey	No	
005	0089_PW352	Clear Plastic Bottle - Natural	125 mL	00070522189296	Green	No	
005	0089_PW352	HDPE (no PTFE)	20 mL	00350821008278	Grey	No	
005	0089_PW352	HDPE (no PTFE)	20 mL	00350821008453	Grey	No	
006	0089_PW381	Clear Plastic Bottle - Natural	125 mL	00070522189344	Green	No	
006	0089_PW381	HDPE (no PTFE)	20 mL	00350821008355	Grey	No	
006	0089_PW381	HDPE (no PTFE)	20 mL	00350821008312	Grey	No	
007	0089_PW351	Clear Plastic Bottle - Natural	125 mL	00070522189234	Green	No	
007	0089_PW351	HDPE (no PTFE)	20 mL	00350522039102	Grey	No	
007	0089_PW351	HDPE (no PTFE)	20 mL	00350522039146	Grey	No	
008	0089_PW380	Clear Plastic Bottle - Natural	125 mL	00070522171478	Green	No	
008	0089_PW380	HDPE (no PTFE)	20 mL	00350522039279	Grey	No	
008	0089_PW380	HDPE (no PTFE)	20 mL	00350522039154	Grey	No	
009	0089_PW401	Clear Plastic Bottle - Natural	125 mL	00070522171572	Green	No	
009	0089_PW401	HDPE (no PTFE)	20 mL	00350522039114	Grey	No	

Wednesday, March 15, 2023 6:29:22 AM

CHAIN OF CUSTODY

(ALS) COC#: 49705 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_PW401	HDPE (no PTFE)	20 mL	00350522039038	Grey	No	
010	0089_SW350	Clear Plastic Bottle - Natural	125 mL	00070522171506	Green	No	
010	0089_SW350	HDPE (no PTFE)	20 mL	00350522039098	Grey	No	
010	0089_SW350	HDPE (no PTFE)	20 mL	00350522039028	Grey	No	
011	0089_SW416	Clear Plastic Bottle - Natural	125 mL	00070522189264	Green	No	
011	0089_SW416	HDPE (no PTFE)	20 mL	00350522039271	Grey	No	
011	0089_SW416	HDPE (no PTFE)	20 mL	00350522039270	Grey	No	
012	0089_SW414	Clear Plastic Bottle - Natural	125 mL	00070522189278	Green	No	
012	0089_SW414	HDPE (no PTFE)	20 mL	00350821008552	Grey	No	
012	0089_SW414	HDPE (no PTFE)	20 mL	00350821008318	Grey	No	
013	0089_SW412	Clear Plastic Bottle - Natural	125 mL	00070522189248	Green	No	
013	0089_SW412	HDPE (no PTFE)	20 mL	00350821008446	Grey	No	
013	0089_SW412	HDPE (no PTFE)	20 mL	00350821008390	Grey	No	
014	0089_PW411	Clear Plastic Bottle - Natural	125 mL	00070522189275	Green	No	
014	0089_PW411	HDPE (no PTFE)	20 mL	00350821008272	Grey	No	
014	0089_PW411	HDPE (no PTFE)	20 mL	00350821008430	Grey	No	
015	0089_PW415	Clear Plastic Bottle - Natural	125 mL	00070522189289	Green	No	
015	0089_PW415	HDPE (no PTFE)	20 mL	00350821008554	Grey	No	
015	0089_PW415	HDPE (no PTFE)	20 mL	00350821008445	Grey	No	
016	0089_PW413	Clear Plastic Bottle - Natural	125 mL	00070522171581	Green	No	
016	0089_PW413	HDPE (no PTFE)	20 mL	00350821008320	Grey	No	
016	0089_PW413	HDPE (no PTFE)	20 mL	00350821008498	Grey	No	

Total Bottle Count: ALS: 48, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2303229**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 49705	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 16-Mar-2023 12:00	Issue Date	: 17-Mar-2023
Client Requested Due Date	: 27-Mar-2023	Scheduled Reporting Date	: **27-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 16 / 16

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2303229-001	15-Mar-2023 10:35	0089_SW353_230315	✓	✓
EP2303229-002	15-Mar-2023 10:37	0089_SW384_230315	✓	✓
EP2303229-003	15-Mar-2023 10:56	0089_SW382_230315	✓	✓
EP2303229-004	15-Mar-2023 10:57	0089_SW383_230315	✓	✓
EP2303229-005	15-Mar-2023 11:00	0089_PW352_230315	✓	✓
EP2303229-006	15-Mar-2023 11:00	0089_PW381_230315	✓	✓
EP2303229-007	15-Mar-2023 11:01	0089_PW351_230315	✓	✓
EP2303229-008	15-Mar-2023 11:02	0089_PW380_230315	✓	✓
EP2303229-009	15-Mar-2023 11:03	0089_PW401_230315	✓	✓
EP2303229-010	15-Mar-2023 11:04	0089_SW350_230315	✓	✓
EP2303229-011	15-Mar-2023 13:05	0089_SW416_230315	✓	✓
EP2303229-012	15-Mar-2023 13:06	0089_SW414_230315	✓	✓
EP2303229-013	15-Mar-2023 13:07	0089_SW412_230315	✓	✓
EP2303229-014	15-Mar-2023 13:08	0089_PW411_230315	✓	✓
EP2303229-015	15-Mar-2023 13:09	0089_PW415_230315	✓	✓
EP2303229-016	15-Mar-2023 13:10	0089_PW413_230315	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2303229**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49705	Issue Date	: 27-Mar-2023 15:15
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW353_230315	0089_SW384_230315	0089_SW382_230315	0089_SW383_230315	0089_PW352_230315
				Sampling date / time	15-Mar-2023 10:35	15-Mar-2023 10:37	15-Mar-2023 10:56	15-Mar-2023 10:57	15-Mar-2023 11:00
Compound	CAS Number	LOR	Unit		EP2303229-001	EP2303229-002	EP2303229-003	EP2303229-004	EP2303229-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		122	121	121	121	122
Total Alkalinity as CaCO3	----	1	mg/L		122	121	121	121	122
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2800	2600	2650	2660	2800
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19800	19300	20200	20300	20700
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		446	444	441	451	459
Magnesium	7439-95-4	1	mg/L		1450	1430	1410	1450	1470
Sodium	7440-23-5	1	mg/L		11800	11700	11500	11800	12100
Potassium	7440-09-7	1	mg/L		544	531	527	542	556
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		619	601	627	630	645
ø Total Cations	----	0.01	meq/L		669	662	652	669	684
ø Ionic Balance	----	0.01	%		3.84	4.86	1.90	2.96	2.99
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW353_230315	0089_SW384_230315	0089_SW382_230315	0089_SW383_230315	0089_PW352_230315
				Sampling date / time	15-Mar-2023 10:35	15-Mar-2023 10:37	15-Mar-2023 10:56	15-Mar-2023 10:57	15-Mar-2023 11:00
Compound	CAS Number	LOR	Unit		EP2303229-001	EP2303229-002	EP2303229-003	EP2303229-004	EP2303229-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW353_230315	0089_SW384_230315	0089_SW382_230315	0089_SW383_230315	0089_PW352_230315
				Sampling date / time	15-Mar-2023 10:35	15-Mar-2023 10:37	15-Mar-2023 10:56	15-Mar-2023 10:57	15-Mar-2023 11:00
Compound	CAS Number	LOR	Unit		EP2303229-001	EP2303229-002	EP2303229-003	EP2303229-004	EP2303229-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**106**	**113**	**102**	**110**
13C8-PFOA	----	0.02	%		**96.1**	**98.3**	**97.2**	**100**	**100**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW381_230315	0089_PW351_230315	0089_PW380_230315	0089_PW401_230315	0089_PW350_230315
				Sampling date / time	15-Mar-2023 11:00	15-Mar-2023 11:01	15-Mar-2023 11:02	15-Mar-2023 11:03	15-Mar-2023 11:04
Compound	CAS Number	LOR	Unit		EP2303229-006	EP2303229-007	EP2303229-008	EP2303229-009	EP2303229-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		126	122	130	124	125
Total Alkalinity as CaCO3	----	1	mg/L		126	122	130	124	125
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2750	2750	2700	2780	3490
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		22600	20700	20100	20100	20100
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		449	451	453	460	450
Magnesium	7439-95-4	1	mg/L		1440	1440	1450	1460	1440
Sodium	7440-23-5	1	mg/L		11600	11800	11900	11900	11700
Potassium	7440-09-7	1	mg/L		539	540	544	548	542
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		697	644	626	627	642
ø Total Cations	----	0.01	meq/L		659	668	673	675	664
ø Ionic Balance	----	0.01	%		2.80	1.87	3.67	3.64	1.65
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.02	<0.01	<0.01	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW381_230315	0089_PW351_230315	0089_PW380_230315	0089_PW401_230315	0089_PW350_230315
				Sampling date / time	15-Mar-2023 11:00	15-Mar-2023 11:01	15-Mar-2023 11:02	15-Mar-2023 11:03	15-Mar-2023 11:04
Compound	CAS Number	LOR	Unit		EP2303229-006	EP2303229-007	EP2303229-008	EP2303229-009	EP2303229-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW381_230315	0089_PW351_230315	0089_PW380_230315	0089_PW401_230315	0089_PW350_230315
			Sampling date / time	15-Mar-2023 11:00	15-Mar-2023 11:01	15-Mar-2023 11:02	15-Mar-2023 11:03	15-Mar-2023 11:04
Compound	CAS Number	LOR	Unit	EP2303229-006	EP2303229-007	EP2303229-008	EP2303229-009	EP2303229-010
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	**0.02**	<0.01	<0.01	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	**0.02**	<0.01	<0.01	**0.02**
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	**0.02**	<0.01	<0.01	**0.02**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**85.5**	**94.5**	**106**	**99.6**	**103**
13C8-PFOA	----	0.02	%	**96.2**	**100**	**98.3**	**95.9**	**97.6**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW416_230315	0089_SW414_230315	0089_SW412_230315	0089_PW411_230315	0089_PW415_230315
				Sampling date / time	15-Mar-2023 13:05	15-Mar-2023 13:06	15-Mar-2023 13:07	15-Mar-2023 13:08	15-Mar-2023 13:09
Compound	CAS Number	LOR	Unit		EP2303229-011	EP2303229-012	EP2303229-013	EP2303229-014	EP2303229-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		121	121	121	211	169
Total Alkalinity as CaCO3	----	1	mg/L		121	121	121	211	169
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2750	2730	2740	2720	2760
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19900	20700	20100	20500	19600
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		448	452	450	477	455
Magnesium	7439-95-4	1	mg/L		1440	1430	1430	1470	1460
Sodium	7440-23-5	1	mg/L		11800	11600	11700	12000	12000
Potassium	7440-09-7	1	mg/L		537	538	537	554	551
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		621	643	626	639	614
ø Total Cations	----	0.01	meq/L		668	658	663	681	679
ø Ionic Balance	----	0.01	%		3.63	1.18	2.82	3.17	5.04
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW416_230315	0089_SW414_230315	0089_SW412_230315	0089_PW411_230315	0089_PW415_230315
				Sampling date / time	15-Mar-2023 13:05	15-Mar-2023 13:06	15-Mar-2023 13:07	15-Mar-2023 13:08	15-Mar-2023 13:09
Compound	CAS Number	LOR	Unit		EP2303229-011	EP2303229-012	EP2303229-013	EP2303229-014	EP2303229-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW416_230315	0089_SW414_230315	0089_SW412_230315	0089_PW411_230315	0089_PW415_230315
				Sampling date / time	15-Mar-2023 13:05	15-Mar-2023 13:06	15-Mar-2023 13:07	15-Mar-2023 13:08	15-Mar-2023 13:09
Compound	CAS Number	LOR	Unit		EP2303229-011	EP2303229-012	EP2303229-013	EP2303229-014	EP2303229-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**102**	**106**	**103**	**102**
13C8-PFOA	----	0.02	%		**96.0**	**96.9**	**101**	**96.9**	**96.3**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW413_230315	----	----	----	----
				Sampling date / time	15-Mar-2023 13:10	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2303229-016	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**120**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**120**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2880**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20200**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**451**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1470**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**11900**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**549**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**632**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**675**	----	----	----	----
ø Ionic Balance	----	0.01	%		**3.29**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW413_230315	----	----	----	----
				Sampling date / time	15-Mar-2023 13:10	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2303229-016	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW413_230315	----	----	----	----
				Sampling date / time	15-Mar-2023 13:10	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2303229-016	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.9**	----	----	----	----
13C8-PFOA	----	0.02	%		**97.1**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2303229**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Mar-2023
C-O-C number	: 49705	Issue Date	: 27-Mar-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4945234)									
EP2303227-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	133	133	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	133	133	0.0	0% - 20%
EP2303229-009	0089_PW401_230315	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	124	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4937764)									
EP2303229-001	0089_SW353_230315	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2800	2790	0.3	0% - 20%
EP2303229-011	0089_SW416_230315	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2750	2760	0.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4937765)									
EP2303229-001	0089_SW353_230315	ED045G: Chloride	16887-00-6	1	mg/L	19800	20300	2.4	0% - 20%
EP2303229-011	0089_SW416_230315	ED045G: Chloride	16887-00-6	1	mg/L	19900	20000	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4937266)									
EP2303227-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	443	446	0.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1420	1430	0.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11500	11700	1.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	531	536	1.0	0% - 20%
EP2303229-004	0089_SW383_230315	ED093F: Calcium	7440-70-2	1	mg/L	451	453	0.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1450	1450	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11800	11900	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	542	542	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4937267)									
EP2303229-014	0089_PW411_230315	ED093F: Calcium	7440-70-2	1	mg/L	477	477	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1470	1480	1.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	12100	1.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	554	561	1.3	0% - 20%
EP2303349-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	10	10	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	16	17	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	88	88	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	16	15	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4946690)									
EP2303198-010	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.03	58.1	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4946690)									
EP2303198-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4946690)									
EP2303198-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4946690) - continued									
EP2303198-010	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4946690)									
EP2303198-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4946690)									
EP2303198-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.03	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.03	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.03	40.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4945234)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	97.4	87.8	118
				<1	200 mg/L	100	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4937764)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	89.9	112
				<1	500 mg/L	97.3	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4937765)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	92.5	88.6	113
				<1	1000 mg/L	101	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4937266)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	107	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	107	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.2	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4937267)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.3	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4946690)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	105	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	95.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	75.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	76.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	95.9	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	96.7	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4946690)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	76.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	75.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	78.8	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4946690) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	79.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	83.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	76.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	87.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4946690)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	80.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	84.9	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	104	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	83.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	72.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	85.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	83.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4946690)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	94.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	84.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	95.4	64.2	133
EP231P: PFAS Sums (QCLot: 4946690)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4937764)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4937764) - continued							
EP2303229-001	0089_SW353_230315	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4937765)							
EP2303229-001	0089_SW353_230315	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2303229**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 16-Mar-2023
Site	: Stirling SW/PW - CG	Issue Date	: 27-Mar-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 16
Order number	: pfas-omp/Stirling	No. of samples analysed	: 16

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2303229--001	0089_SW353_230315	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2303229--001	0089_SW353_230315	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	19	5.26	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	19	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)		*Sample Date*	*Extraction / Preparation* Date extracted	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW353_230315,	0089_SW384_230315,	**15-Mar-2023**	**----**	----	----	**22-Mar-2023**	29-Mar-2023	✓
0089_SW382_230315,	0089_SW383_230315,							
0089_PW352_230315,	0089_PW381_230315,							
0089_PW351_230315,	0089_PW380_230315,							
0089_PW401_230315,	0089_PW350_230315,							
0089_SW416_230315,	0089_SW414_230315,							
0089_SW412_230315,	0089_PW411_230315,							
0089_PW415_230315,	0089_PW413_230315							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW353_230315, 0089_SW384_230315, 0089_SW382_230315, 0089_SW383_230315, 0089_PW352_230315, 0089_PW381_230315, 0089_PW351_230315, 0089_PW380_230315, 0089_PW401_230315, 0089_PW350_230315, 0089_SW416_230315, 0089_SW414_230315, 0089_SW412_230315, 0089_PW411_230315, 0089_PW415_230315, 0089_PW413_230315	**15-Mar-2023**	**----**	----	----	**23-Mar-2023**	12-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW353_230315, 0089_SW384_230315, 0089_SW382_230315, 0089_SW383_230315, 0089_PW352_230315, 0089_PW381_230315, 0089_PW351_230315, 0089_PW380_230315, 0089_PW401_230315, 0089_PW350_230315, 0089_SW416_230315, 0089_SW414_230315, 0089_SW412_230315, 0089_PW411_230315, 0089_PW415_230315, 0089_PW413_230315	**15-Mar-2023**	**----**	----	----	**23-Mar-2023**	12-Apr-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW353_230315, 0089_SW384_230315, 0089_SW382_230315, 0089_SW383_230315, 0089_PW352_230315, 0089_PW381_230315, 0089_PW351_230315, 0089_PW380_230315, 0089_PW401_230315, 0089_PW350_230315, 0089_SW416_230315, 0089_SW414_230315, 0089_SW412_230315, 0089_PW411_230315, 0089_PW415_230315, 0089_PW413_230315	**15-Mar-2023**	**----**	----	----	**20-Mar-2023**	22-Mar-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW353_230315, 0089_SW384_230315, 0089_SW382_230315, 0089_SW383_230315, 0089_PW352_230315, 0089_PW381_230315, 0089_PW351_230315, 0089_PW380_230315, 0089_PW401_230315, 0089_PW350_230315, 0089_SW416_230315, 0089_SW414_230315, 0089_SW412_230315, 0089_PW411_230315, 0089_PW415_230315, 0089_PW413_230315	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW353_230315, 0089_SW384_230315, 0089_SW382_230315, 0089_SW383_230315, 0089_PW352_230315, 0089_PW381_230315, 0089_PW351_230315, 0089_PW380_230315, 0089_PW401_230315, 0089_PW350_230315, 0089_SW416_230315, 0089_SW414_230315, 0089_SW412_230315, 0089_PW411_230315, 0089_PW415_230315, 0089_PW413_230315	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW353_230315, 0089_SW384_230315, 0089_SW382_230315, 0089_SW383_230315, 0089_PW352_230315, 0089_PW381_230315, 0089_PW351_230315, 0089_PW380_230315, 0089_PW401_230315, 0089_PW350_230315, 0089_SW416_230315, 0089_SW414_230315, 0089_SW412_230315, 0089_PW411_230315, 0089_PW415_230315, 0089_PW413_230315	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW353_230315, 0089_SW384_230315, 0089_SW382_230315, 0089_SW383_230315, 0089_PW352_230315, 0089_PW381_230315, 0089_PW351_230315, 0089_PW380_230315, 0089_PW401_230315, 0089_PW350_230315, 0089_SW416_230315, 0089_SW414_230315, 0089_SW412_230315, 0089_PW411_230315, 0089_PW415_230315, 0089_PW413_230315	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW353_230315, 0089_SW384_230315, 0089_SW382_230315, 0089_SW383_230315, 0089_PW352_230315, 0089_PW381_230315, 0089_PW351_230315, 0089_PW380_230315, 0089_PW401_230315, 0089_PW350_230315, 0089_SW416_230315, 0089_SW414_230315, 0089_SW412_230315, 0089_PW411_230315, 0089_PW415_230315, 0089_PW413_230315	**15-Mar-2023**	**23-Mar-2023**	11-Sep-2023	✓	**27-Mar-2023**	11-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	19	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

eurofins | mgt

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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Stantec Australia	Contact Name : [redacted]	Purchase Order : 304700525/730	COC Number : 304700525/730 -03
Office Address : GF, 226 Adelaide Terrace, Perth WA 6000		PROJECT Number : WA_0089_PFASOMP_23	Eurofins | mgt quote ID :
	Email for COC/SRN/Results : [redacted]	PROJECT Name : WA_0089_PFASOMP_23	Data output format: PDF; ESDAT

Special Directions & Comments :
Please send ESdat files to [redacted] ith the project No in the header file

Please send invoice to
[redacted]

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	PFAS (28 analytes)
1	0089_QC201_230313	13/03/2023	Water	X
2	0089_QC202_230313	13/03/2023	Water	X
3	0089_QC203_230313	13/03/2023	Water	X
4	0089_QC204_230313	13/03/2023	Soil	X
5	0089_QC205_230313	13/03/2023	Water	X
6	0089_QC206_230313	13/03/2023	Water	X
7	0089_QC207_230313	13/03/2023	Water	X
8	0089_QC208_230313	13/03/2023	Soil	X
9	0089_QC209_230313	13/03/2023	Water	X
10	0089_QC210_230313	13/03/2023	Water	X
11	0089_QC211_230313	13/03/2023	Water	X
12	0089_QC212_230313	13/03/2023	Soil	X
13	0089_QC213_230313	13/03/2023	Water	X
14	0089_QC214_230313	13/03/2023	Water	X
15	0089_QC215_230313	13/03/2023	Water	X
16	0089_QC216_230314	14/03/2023	Water	X
17	0089_QC217_230314	14/03/2023	Soil	X
18	0089_QC218_230314	14/03/2023	Water	X

Analytes

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	

Sample comments:

Laboratory Staff		Turn around time	Method Of Shipment	Temperature on arrival:
Relinquished By: Stantec Australia	Received By: [redacted]	1 DAY ☐ 2 DAY ☐ 3 DAY ☐	☑ Courier	10.2
Date & Time :	Date & Time : 15/3/23 12:55	STANDARD ☑ Other:	☐ Hand Delivered	Report number:
Signature:	Signature: [redacted]		☐ Postal	912487.
			Courier Consignment # :	

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Sample Receipt Advice

Company name:	Stantec Australia Pty Ltd (WA)
Contact name:	[redacted]
Project name:	Not provided
Project ID:	WA_0089_PFASOMP_23
Turnaround time:	5 Day
Date/Time received	Mar 15, 2023 12:55 PM
Eurofins reference	972487

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted] **on phone : or by email:** [redacted]

Results will be delivered electronically via email to [redacted] - [redacted]

Note: A copy of these results will also be delivered to the general Stantec Australia Pty Ltd (WA) email address.

Global Leader - Results you can trust

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name:
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 972487
Phone: [redacted]
Fax:

Received: Mar 15, 2023 12:55 PM
Due: Mar 22, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_230313	Mar 13, 2023		Water	L23-Ma0038272		X
2	0089_QC202_230313	Mar 13, 2023		Water	L23-Ma0038273		X
3	0089_QC203_230313	Mar 13, 2023		Water	L23-Ma0038274		X
4	0089_QC204_230313	Mar 13, 2023		Soil	L23-Ma0038275	X	X
5	0089_QC205_230313	Mar 13, 2023		Water	L23-Ma0038276		X
6	0089_QC206_230313	Mar 13, 2023		Water	L23-Ma0038277		X
7	0089_QC207_230313	Mar 13, 2023		Water	L23-Ma0038278		X
8	0089_QC208_230313	Mar 13, 2023		Soil	L23-Ma0038279	X	X

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WA 6000

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Order No.: 304700525/730
Report #: 972487
Phone: [redacted]
Fax:

Received: Mar 15, 2023 12:55 PM
Due: Mar 22, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0089_QC209_230313	Mar 13, 2023		Water	L23-Ma0038280		X
10	0089_QC210_230313	Mar 13, 2023		Water	L23-Ma0038281		X
11	0089_QC211_230313	Mar 13, 2023		Water	L23-Ma0038282		X
12	0089_QC212_230313	Mar 13, 2023		Soil	L23-Ma0038283	X	X
13	0089_QC213_230313	Mar 13, 2023		Water	L23-Ma0038284		X
14	0089_QC214_230313	Mar 13, 2023		Water	L23-Ma0038285		X
15	0089_QC215_230313	Mar 13, 2023		Water	L23-Ma0038286		X
16	0089_QC216_230314	Mar 14, 2023		Water	L23-Ma0038287		X
17	0089_QC217_230314	Mar 14, 2023		Soil	L23-Ma0038288	X	X
18	0089_QC218_	Mar 14, 2023		Water	L23-Ma0038289		X

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WA 6000

Project Name:
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 972487
Phone: [redacted]
Fax:

Received: Mar 15, 2023 12:55 PM
Due: Mar 22, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
18	0089_QC218_230314	Mar 14, 2023		Water	L23-Ma0038289		
Test Counts						4	18

Stantec Australia Pty Limited
6F 226,Adelaide Terrace
Perth
WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **972487-S**
Project name
Project ID WA_0089_PFASOMP_23
Received Date Mar 15, 2023

Client Sample ID			**0089_QC204_230313**	**0089_QC208_230313**	**0089_QC212_230313**	**0089_QC217_230314**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L23-Ma0038275**	**L23-Ma0038279**	**L23-Ma0038283**	**L23-Ma0038288**
Date Sampled			**Mar 13, 2023**	**Mar 13, 2023**	**Mar 13, 2023**	**Mar 14, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	31	28	30	32
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	49	49	53	47
13C5-PFPeA (surr.)	1	%	84	83	89	71
13C5-PFHxA (surr.)	1	%	101	97	103	87
13C4-PFHpA (surr.)	1	%	98	94	96	82
13C8-PFOA (surr.)	1	%	67	71	75	60
13C5-PFNA (surr.)	1	%	81	83	84	76
13C6-PFDA (surr.)	1	%	89	82	96	78
13C2-PFUnDA (surr.)	1	%	100	86	97	91
13C2-PFDoDA (surr.)	1	%	98	91	103	84
13C2-PFTeDA (surr.)	1	%	104	95	105	98
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			0089_QC204_230313	0089_QC208_230313	0089_QC212_230313	0089_QC217_230314
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L23-Ma0038275	L23-Ma0038279	L23-Ma0038283	L23-Ma0038288
Date Sampled			Mar 13, 2023	Mar 13, 2023	Mar 13, 2023	Mar 14, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	139	146	136	131
D3-N-MeFOSA (surr.)	1	%	122	109	121	106
D5-N-EtFOSA (surr.)	1	%	118	110	126	110
D7-N-MeFOSE (surr.)	1	%	135	118	106	120
D9-N-EtFOSE (surr.)	1	%	117	106	112	102
D5-N-EtFOSAA (surr.)	1	%	86	70	77	74
D3-N-MeFOSAA (surr.)	1	%	113	100	104	112
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	95	95	106	97
18O2-PFHxS (surr.)	1	%	89	87	87	84
13C8-PFOS (surr.)	1	%	92	96	108	86
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	127	135	141	128
13C2-6:2 FTSA (surr.)	1	%	82	95	89	67
13C2-8:2 FTSA (surr.)	1	%	83	88	81	89
13C2-10:2 FTSA (surr.)	1	%	101	100	80	88
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Mar 16, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Mar 20, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Mar 20, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Mar 20, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Mar 20, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Mar 16, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name:
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Phone: [redacted]
Fax:

Received: Mar 15, 2023 12:55 PM
Due: Mar 22, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_230313	Mar 13, 2023		Water	L23-Ma0038272		X
2	0089_QC202_230313	Mar 13, 2023		Water	L23-Ma0038273		X
3	0089_QC203_230313	Mar 13, 2023		Water	L23-Ma0038274		X
4	0089_QC204_230313	Mar 13, 2023		Soil	L23-Ma0038275	X	X
5	0089_QC205_230313	Mar 13, 2023		Water	L23-Ma0038276		X
6	0089_QC206_230313	Mar 13, 2023		Water	L23-Ma0038277		X
7	0089_QC207_230313	Mar 13, 2023		Water	L23-Ma0038278		X
8	0089_QC208_230313	Mar 13, 2023		Soil	L23-Ma0038279	X	X

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name:
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 972487
Phone: [redacted]
Fax:

Received: Mar 15, 2023 12:55 PM
Due: Mar 22, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0089_QC209_230313	Mar 13, 2023		Water	L23-Ma0038280		X
10	0089_QC210_230313	Mar 13, 2023		Water	L23-Ma0038281		X
11	0089_QC211_230313	Mar 13, 2023		Water	L23-Ma0038282		X
12	0089_QC212_230313	Mar 13, 2023		Soil	L23-Ma0038283	X	X
13	0089_QC213_230313	Mar 13, 2023		Water	L23-Ma0038284		X
14	0089_QC214_230313	Mar 13, 2023		Water	L23-Ma0038285		X
15	0089_QC215_230313	Mar 13, 2023		Water	L23-Ma0038286		X
16	0089_QC216_230314	Mar 14, 2023		Water	L23-Ma0038287		X
17	0089_QC217_230314	Mar 14, 2023		Soil	L23-Ma0038288	X	X
18	0089_QC218_	Mar 14, 2023		Water	L23-Ma0038289		X

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
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Project Name:
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 972487
Phone: [redacted]
Fax:

Received: Mar 15, 2023 12:55 PM
Due: Mar 22, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
18	0089_QC218_230314	Mar 14, 2023		Water	L23-Ma0038289		
Test Counts						4	18

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	87			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	92			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	93			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	92			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	88			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	92			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	91			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	89			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	89			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	87			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	103			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	90			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	80			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	95			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	81			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	87			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	91			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	95			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	83			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	80			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	94			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	79			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	80			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	82			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	79			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	75			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	79			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	86			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	L23-Ma0038275	CP	%	31	30	3.4	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS

[redacted]
[redacted]
Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
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Attention: [redacted]

Report **972487-W-V3**
Project name
Project ID WA_0089_PFASOMP_23
Received Date Mar 15, 2023

Client Sample ID			**0089_QC201_230313**	**0089_QC202_230313**	**0089_QC203_230313**	**0089_QC205_230313**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L23-Ma0038272**	**L23-Ma0038273**	**L23-Ma0038274**	**L23-Ma0038276**
Date Sampled			**Mar 13, 2023**	**Mar 13, 2023**	**Mar 13, 2023**	**Mar 13, 2023**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	0.06	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.05	< 0.01	0.01	0.02
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	0.28	< 0.01	0.03	0.09
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]0.02	< 0.01	< 0.01	[N09]0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.98
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	69	57	65	70
13C5-PFPeA (surr.)	1	%	83	85	84	88
13C5-PFHxA (surr.)	1	%	62	60	62	65
13C4-PFHpA (surr.)	1	%	64	64	63	65
13C8-PFOA (surr.)	1	%	56	56	57	52
13C5-PFNA (surr.)	1	%	85	78	85	82
13C6-PFDA (surr.)	1	%	107	84	146	116
13C2-PFUnDA (surr.)	1	%	79	55	145	86
13C2-PFDoDA (surr.)	1	%	69	49	75	83
13C2-PFTeDA (surr.)	1	%	82	61	79	90
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	105	87	104	110
D3-N-MeFOSA (surr.)	1	%	97	87	115	113

Client Sample ID			0089_QC201_230313	0089_QC202_230313	0089_QC203_230313	0089_QC205_230313
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Ma0038272	L23-Ma0038273	L23-Ma0038274	L23-Ma0038276
Date Sampled			Mar 13, 2023	Mar 13, 2023	Mar 13, 2023	Mar 13, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	106	95	128	133
D7-N-MeFOSE (surr.)	1	%	72	60	86	92
D9-N-EtFOSE (surr.)	1	%	73	58	80	87
D5-N-EtFOSAA (surr.)	1	%	55	46	65	68
D3-N-MeFOSAA (surr.)	1	%	61	47	63	63
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.33	< 0.01	0.02	0.02
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	0.08	< 0.01	0.02	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]0.33	< 0.01	< 0.01	[N09]0.04
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]2.1	< 0.01	[N09]0.05	[N09]5.2
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]1.1
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.03	< 0.01	< 0.01	[N09]0.99
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	72	71	74	75
18O2-PFHxS (surr.)	1	%	78	66	65	90
13C8-PFOS (surr.)	1	%	89	74	102	80
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	65	58	63	77
13C2-6:2 FTSA (surr.)	1	%	66	93	64	72
13C2-8:2 FTSA (surr.)	1	%	89	67	96	89
13C2-10:2 FTSA (surr.)	1	%	54	38	64	71
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	2.13	< 0.01	0.05	6.19
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.03	< 0.01	< 0.01	1.97
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	2.13	< 0.01	0.05	7.17
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	2.87	< 0.05	0.11	7.31
Sum of PFASs (n=30)*	0.1	ug/L	3.28	< 0.1	0.13	8.45

Client Sample ID			0089_QC206_230313	0089_QC207_230313	0089_QC209_230313	0089_QC210_230313
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Ma0038277	L23-Ma0038278	L23-Ma0038280	L23-Ma0038281
Date Sampled			Mar 13, 2023	Mar 13, 2023	Mar 13, 2023	Mar 13, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	0.13	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	0.03	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	0.21	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]< 0.01	[N09]0.02	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]< 0.01	[N09]0.03	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	93	63	55	75
13C5-PFPeA (surr.)	1	%	117	76	73	82
13C5-PFHxA (surr.)	1	%	116	70	72	79
13C4-PFHpA (surr.)	1	%	114	72	70	79
13C8-PFOA (surr.)	1	%	114	73	65	80
13C5-PFNA (surr.)	1	%	107	87	64	91
13C6-PFDA (surr.)	1	%	95	77	50	62
13C2-PFUnDA (surr.)	1	%	65	69	38	60
13C2-PFDoDA (surr.)	1	%	60	66	36	53
13C2-PFTeDA (surr.)	1	%	61	63	53	66
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	84	66	67	77
D3-N-MeFOSA (surr.)	1	%	50	93	88	121
D5-N-EtFOSA (surr.)	1	%	46	84	84	121
D7-N-MeFOSE (surr.)	1	%	67	62	55	56
D9-N-EtFOSE (surr.)	1	%	66	64	37	58
D5-N-EtFOSAA (surr.)	1	%	70	59	52	50
D3-N-MeFOSAA (surr.)	1	%	80	89	52	56
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	0.13	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	0.02	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]< 0.01	[N09]0.24	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]< 0.01	[N09]1.3	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]< 0.01	[N09]0.03	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.01	[N09]0.44	[N09]0.02	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			0089_QC206_230313	0089_QC207_230313	0089_QC209_230313	0089_QC210_230313
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Ma0038277	L23-Ma0038278	L23-Ma0038280	L23-Ma0038281
Date Sampled			Mar 13, 2023	Mar 13, 2023	Mar 13, 2023	Mar 13, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
13C3-PFBS (surr.)	1	%	119	84	83	100
18O2-PFHxS (surr.)	1	%	117	60	80	84
13C8-PFOS (surr.)	1	%	129	78	55	75
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	145	81	58	99
13C2-6:2 FTSA (surr.)	1	%	121	76	56	88
13C2-8:2 FTSA (surr.)	1	%	81	89	52	69
13C2-10:2 FTSA (surr.)	1	%	70	51	22	56
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.01	1.74	0.02	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.01	0.47	0.02	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.01	1.77	0.02	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	2.29	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	2.58	< 0.1	< 0.1

Client Sample ID			0089_QC211_230313	0089_QC213_230313	0089_QC214_230313	0089_QC215_230313
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Ma0038282	L23-Ma0038284	L23-Ma0038285	L23-Ma0038286
Date Sampled			Mar 13, 2023	Mar 13, 2023	Mar 13, 2023	Mar 13, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	79	78	60	69
13C5-PFPeA (surr.)	1	%	72	75	75	80
13C5-PFHxA (surr.)	1	%	68	74	71	77
13C4-PFHpA (surr.)	1	%	64	68	70	76
13C8-PFOA (surr.)	1	%	67	70	71	73
13C5-PFNA (surr.)	1	%	89	91	92	83
13C6-PFDA (surr.)	1	%	65	70	68	50

Client Sample ID			0089_QC211_230313	0089_QC213_230313	0089_QC214_230313	0089_QC215_230313
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Ma0038282	L23-Ma0038284	L23-Ma0038285	L23-Ma0038286
Date Sampled			Mar 13, 2023	Mar 13, 2023	Mar 13, 2023	Mar 13, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C2-PFUnDA (surr.)	1	%	61	73	67	47
13C2-PFDoDA (surr.)	1	%	51	67	62	40
13C2-PFTeDA (surr.)	1	%	51	71	66	41
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	81	88	81	63
D3-N-MeFOSA (surr.)	1	%	112	117	95	83
D5-N-EtFOSA (surr.)	1	%	113	115	84	78
D7-N-MeFOSE (surr.)	1	%	63	76	69	48
D9-N-EtFOSE (surr.)	1	%	62	68	59	47
D5-N-EtFOSAA (surr.)	1	%	65	73	63	48
D3-N-MeFOSAA (surr.)	1	%	66	74	67	51
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]0.01	[N09]0.07
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	92	96	96	103
18O2-PFHxS (surr.)	1	%	77	79	81	84
13C8-PFOS (surr.)	1	%	79	88	84	65
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	59	83	62	76
13C2-6:2 FTSA (surr.)	1	%	69	75	75	81
13C2-8:2 FTSA (surr.)	1	%	76	84	72	59
13C2-10:2 FTSA (surr.)	1	%	58	61	58	45

Client Sample ID			0089_QC211_230313	0089_QC213_230313	0089_QC214_230313	0089_QC215_230313
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L23-Ma0038282**	**L23-Ma0038284**	**L23-Ma0038285**	**L23-Ma0038286**
Date Sampled			**Mar 13, 2023**	**Mar 13, 2023**	**Mar 13, 2023**	**Mar 13, 2023**
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	0.01	0.08
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	0.01	0.07
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	0.01	0.08
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	0.08
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			0089_QC216_230314	0089_QC218_230314
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**L23-Ma0038287**	**L23-Ma0038289**
Date Sampled			**Mar 14, 2023**	**Mar 14, 2023**
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.02
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	65	83
13C5-PFPeA (surr.)	1	%	80	92
13C5-PFHxA (surr.)	1	%	77	97
13C4-PFHpA (surr.)	1	%	76	109
13C8-PFOA (surr.)	1	%	75	85
13C5-PFNA (surr.)	1	%	93	96
13C6-PFDA (surr.)	1	%	60	95
13C2-PFUnDA (surr.)	1	%	57	92
13C2-PFDoDA (surr.)	1	%	48	79
13C2-PFTeDA (surr.)	1	%	51	73
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	81	70

Client Sample ID			0089_QC216_230314	0089_QC218_230314
Sample Matrix			Water	Water
Eurofins Sample No.			L23-Ma0038287	L23-Ma0038289
Date Sampled			Mar 14, 2023	Mar 14, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
D3-N-MeFOSA (surr.)	1	%	109	83
D5-N-EtFOSA (surr.)	1	%	95	74
D7-N-MeFOSE (surr.)	1	%	56	72
D9-N-EtFOSE (surr.)	1	%	52	71
D5-N-EtFOSAA (surr.)	1	%	53	69
D3-N-MeFOSAA (surr.)	1	%	61	82
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.02	[N09]0.02
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.14	[N09]0.28
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	103	119
18O2-PFHxS (surr.)	1	%	85	95
13C8-PFOS (surr.)	1	%	82	90
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	75	103
13C2-6:2 FTSA (surr.)	1	%	79	138
13C2-8:2 FTSA (surr.)	1	%	74	105
13C2-10:2 FTSA (surr.)	1	%	42	107
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	0.16	0.3
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.14	0.28
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.16	0.3
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.16	0.3
Sum of PFASs (n=30)*	0.1	ug/L	0.16	0.3

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Mar 24, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Mar 24, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Mar 24, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Mar 24, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Mar 16, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name:
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 972487
Phone: [redacted]
Fax:

Received: Mar 15, 2023 12:55 PM
Due: Mar 22, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_230313	Mar 13, 2023		Water	L23-Ma0038272		X
2	0089_QC202_230313	Mar 13, 2023		Water	L23-Ma0038273		X
3	0089_QC203_230313	Mar 13, 2023		Water	L23-Ma0038274		X
4	0089_QC204_230313	Mar 13, 2023		Soil	L23-Ma0038275	X	X
5	0089_QC205_230313	Mar 13, 2023		Water	L23-Ma0038276		X
6	0089_QC206_230313	Mar 13, 2023		Water	L23-Ma0038277		X
7	0089_QC207_230313	Mar 13, 2023		Water	L23-Ma0038278		X
8	0089_QC208_230313	Mar 13, 2023		Soil	L23-Ma0038279	X	X

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Received: Mar 15, 2023 12:55 PM
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Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0089_QC209_230313	Mar 13, 2023		Water	L23-Ma0038280		X
10	0089_QC210_230313	Mar 13, 2023		Water	L23-Ma0038281		X
11	0089_QC211_230313	Mar 13, 2023		Water	L23-Ma0038282		X
12	0089_QC212_230313	Mar 13, 2023		Soil	L23-Ma0038283	X	X
13	0089_QC213_230313	Mar 13, 2023		Water	L23-Ma0038284		X
14	0089_QC214_230313	Mar 13, 2023		Water	L23-Ma0038285		X
15	0089_QC215_230313	Mar 13, 2023		Water	L23-Ma0038286		X
16	0089_QC216_230314	Mar 14, 2023		Water	L23-Ma0038287		X
17	0089_QC217_230314	Mar 14, 2023		Soil	L23-Ma0038288	X	X
18	0089_QC218_	Mar 14, 2023		Water	L23-Ma0038289		X

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Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
18	0089_QC218_230314	Mar 14, 2023		Water	L23-Ma0038289		
Test Counts						4	18

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	114			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	111			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	97			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	92			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	92			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	95			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	95			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	98			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	98			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	116			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	97			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	98			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	92			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	98			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	90			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	93			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	91			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	98			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	87			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	96			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	105			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	92			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	95			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	93			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	88			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	82			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	92			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	K23-Ma0021037	NCP	%	95			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	K23-Ma0021037	NCP	%	122			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	K23-Ma0021037	NCP	%	102			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	K23-Ma0021037	NCP	%	96			50-150	Pass	
Perfluorooctanoic acid (PFOA)	K23-Ma0021037	NCP	%	94			50-150	Pass	
Perfluorononanoic acid (PFNA)	K23-Ma0021037	NCP	%	95			50-150	Pass	
Perfluorodecanoic acid (PFDA)	K23-Ma0021037	NCP	%	96			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	K23-Ma0021037	NCP	%	100			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	K23-Ma0021037	NCP	%	99			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	K23-Ma0021037	NCP	%	127			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	K23-Ma0021037	NCP	%	99			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	K23-Ma0021037	NCP	%	97			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	K23-Ma0021037	NCP	%	105			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	K23-Ma0021037	NCP	%	103			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	K23-Ma0021037	NCP	%	90			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	K23-Ma0021037	NCP	%	99			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	K23-Ma0021037	NCP	%	90			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	K23-Ma0021037	NCP	%	114			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	K23-Ma0021037	NCP	%	90			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	K23-Ma0021037	NCP	%	86			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	K23-Ma0021037	NCP	%	100			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	K23-Ma0021037	NCP	%	95			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Ma0034077	NCP	%	134			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	K23-Ma0021037	NCP	%	98			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	K23-Ma0021037	NCP	%	97			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	K23-Ma0021037	NCP	%	88			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	K23-Ma0021037	NCP	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	K23-Ma0021037	NCP	%	119			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	K23-Ma0021037	NCP	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	K23-Ma0021037	NCP	%	97			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Ma0045190	NCP	ug/L	1.6	1.6	3.0	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Ma0045190	NCP	ug/L	0.44	0.42	4.4	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Ma0045190	NCP	ug/L	0.81	0.82	1.0	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Ma0045190	NCP	ug/L	0.25	0.24	5.1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Ma0045190	NCP	ug/L	0.35	0.34	3.4	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Ma0045190	NCP	ug/L	0.01	0.01	9.4	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Ma0045190	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Ma0045190	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Ma0045190	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Ma0045190	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Ma0045190	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Ma0045190	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Ma0045190	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Ma0045190	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Ma0045190	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Ma0045190	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Ma0045190	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Ma0045190	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Ma0045190	NCP	ug/L	1.4	1.4	1.7	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Ma0045190	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Ma0045190	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Ma0045190	NCP	ug/L	0.05	0.05	6.0	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Ma0034076	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Ma0045190	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Ma0045190	NCP	ug/L	0.13	0.12	6.7	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Ma0045190	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Ma0045190	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Ma0045190	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Ma0045190	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Ma0045190	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

v2 report issued with repeated PFAS results for sample 23-Ma0038277 upon client request.

v3 report issued with updated sums for PFAS on sample 23-Ma0038277.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager

[redacted] Senior Analyst-PFAS

[redacted] Senior Analyst-PFAS

[redacted]

[redacted]

Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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APPENDIX

D

FIELD RECORDS & CALIBRATION CERTIFICATES

Cardno

now

Stantec

Monitoring Date	Monitoring Location ID	Sample ID	Screen Interval	TOC	Well Depth (m)	SWL Time	SWL (mbTOC)	RWL (mAHD)	Observations	Sampling Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	QC Dup Sample #	Odour ?	Odour Comments	colour
13/03/2023	MW109	0089_MW109_230313	2.5-5.5_	4.446	5.5	10:23	4.12	0.326		HydraSleeve	21.9	2.63	1192	774	7.15	99.8	107/207	no		Clear
13/03/2023	MW112	0089_MW112_230313	3.0 - 6.0	3.973	6.0	10:08	3.485	0.488		HydraSleeve	22.2	1.45	583	38.02	7.42	-76.2		no		Clear
13/03/2023	MW120	0089_MW120_230313	2.5-5.5_	4.409	5.5	09:54	4.075	0.334		HydraSleeve	22.2	1.77	704	458	7.5	123.1	105/205	no		Clear
13/03/2023	MW121	0089_MW121_230313	2.7-5.7_	3.7	5.7	09:22	3.36	0.34	Insufficient water column to fill hydrasleeve	HandBailing	22.6	5.15	599	389.1	7.77	109.3		no		Cloudy
13/03/2023	MW123	0089_MW123_230313	4.5-8_	6.62	8.0	08:59	6.305	0.315		HydraSleeve	21.4	1.96	2474	1608	7.4	118.5	101/201			Cloudy
13/03/2023	MW124	0089_MW124_230313	0.75-4_	1.899	4.0	09:03	1.85	0.049		HydraSleeve	21.6	0.58	43647	30369	6.72	-316.9		yes	Hydrogen sulfide smell	Clear
13/03/2023	MW125	0089_MW125_230313	0.9-3.9_	1.882	3.9	10:40	1.79	0.092		HydraSleeve	22.2	0.16	39002	26794	6.56	-290.9		no		Clear
13/03/2023	MW126	0089_MW126_230313	0.9-3.9_	1.948	3.9	11:38	1.85	0.098		HydraSleeve	23.9	0.38	38467	25550	6.36	-331.6	QC110/210	yes	Strong hydrogen sulfide	Clear
13/03/2023	MW127	0089_MW127_230313	0.9-3.9_	1.771	3.9	12:09	1.72	0.051		HydraSleeve	23	1.15	35750	24132	6.52	-319.4		no		Clear
13/03/2023	MW128		2.5-5.5_	4.537	5.5	10:51			Dry	HydraSleeve										
15/03/2023	MW139	0089_MW139_230315	2-5_	2.273	5.0	09:03	2.108	0.165		HydraSleeve	23.1	2.43	5545	3601.5	7.5	80.5				
15/03/2023	MW141	0089_MW141_230315	2-5_	3.025	5.0	09:17	2.899	0.126		HydraSleeve	21.5	0.83	26283	17082	6.91	65.8				
15/03/2023	MW142	0089_MW142_230315	0.25-4_	2.573	4.0	10:07	2.47	0.103		HydraSleeve	22.4	0.52	34518	22431.5	7.03	-9.9				
15/03/2023	MW147	0089_MW147_230315	2-5_	3.423	5.2	09:35	3.071	0.352	Unblocked	HydraSleeve	21.5	1.09	29572	19220.5	7.12	-66.5				
15/03/2023	MW149	0089_MW149_230315	1-4_	2.303	4.0	10:19	2.056	0.247		HydraSleeve	22	0.99	48864	31765.5	7.44	27.6				
13/03/2023	MW158	0089_MW158_230313	NA	14.541	15.82	11:47	14.252	0.289		HydraSleeve	21.7	0.97	13868	9015.5	7.26	93.1				
13/03/2023	MW161	0089_MW161_230313	NA	17.225	18.13	11:46	16.807	0.418		HydraSleeve	22	1.9	2971	1930	7.49	89.8				
13/03/2023	MW166	0089_MW166_230313	10-13_	11.89	13.0	11:44	11.313	0.577		HydraSleeve	21.5	3.2	3901	2535	7.29	86.9				
13/03/2023	MW171	0089_MW171_230313	28.5-31.5_	29.238	31.5	11:39	28.325	0.913		HydraSleeve	21.2	1.87	16011	10432	7.17	84.1	QC103/203			Clear
13/03/2023	MW172	0089_MW172_230313		16.772	26.0	11:43	16.415	0.357		HydraSleeve	22.8	3.1	5703	3705	7.49	88.5				
13/03/2023	MW173	0089_MW173_230313	NA	10.08	11.11	14:06	9.614	0.466		HydraSleeve	23.2	0.86	3690	2398.5	7	62.7				
13/03/2023	MW193	0089_MW193_230313	10.5-13.5_	11.86	13.5	14:05	11.31	0.55		HydraSleeve	22.8	1.08	3166	2060.5	7.28	53.6				
13/03/2023	MW195D	0089_MW195D_230313	10-13_	4.363	13.0	14:02	4.142	0.221		HydraSleeve	22.5	1.38	24740	16081	7.12	-149.5				
13/03/2023	MW195S	0089_MW195S_230313	3.5-6.5_	4.571	6.5	14:03	4.205	0.366		HydraSleeve	23.1	1.22	4419	2873	7.22	34.5	QC113/213	no		Clear
13/03/2023	MW196	0089_MW196_230313	NA	12.75	13.8	11:50	12.48	0.27		HydraSleeve	22.6	5.2	617	4007	7.79	116.8		no		Cloudy
14/03/2023	MW197	0089_MW197_230314		2.28		09:27	2.187	0.093		HydraSleeve	22.7	1.18	3324	2164.5	7.59	75.9				
13/03/2023	MW199	0089_MW199_230313	NA	11.8	NA	11:48	11.548	0.252		HydraSleeve	22.6	1.21	12823	8333	7.26	87.8	QC111/211			
14/03/2023	MW200	0089_MW200_230314	NA	2.07	NA	09:55	1.998	0.072		HydraSleeve	23.1	1.34	8944	5817.5	7.38	18.3				
13/03/2023	MW202	0089_MW202_230313	NA	2.12	NA	13:06	1.77	0.35		HydraSleeve	22.5	2.84	1762	1204	6.97	-159.7		no		Clear
13/03/2023	MW203	0089_MW203_230313	NA	10.855	12.9	14:23	10.58	0.275		HydraSleeve	23.8	3.98	229.1	1513	7.29	-246.8		no		Clear
14/03/2023	MW214	0089_MW214_230314	5.5-9_	8.075	9.0	11:25	7.726	0.349		HydraSleeve	20.3	1.33	8127	5284.5	7.32	36.1				
14/03/2023	MW215	0089_MW215_230314	1.5-4.5_	3.794	4.5	11:40	3.542	0.252		HydraSleeve	20.9	1.9	2103	1365	7.39	68.1				
14/03/2023	MW216	0089_MW216_230314	6-9_	8.329	6.0	11:17	7.944	0.385		HydraSleeve	20.1	1.84	5002	3256.5	7.38	58.8				
15/03/2023	MW217	0089_MW217_230315	6.5-9.5_	8.847	9.5	08:36	8.47	0.377		HydraSleeve	21.4	5.58	1053	685	7.45	1262		no		Clear
15/03/2023	MW220	0089_MW220_230315	NA	NA	NA	09:14			No rwl reading water taken, swl lower than sleeve	HydraSleeve	20.6	1.93	773	502	7.46	117.8		no		Clear
15/03/2023	MW224	0089_MW224_230315	11.25-14.25_	13.372	14.25	09:05	12.975	0.397		HydraSleeve	20.4	6.5	911	593	7.74	113.2		no		Clear
14/03/2023	MW225	0089_MW225_230314	2-5_	4.066	5.0	11:56	3.865	0.201		HydraSleeve	21.6	0.92	2291	1495	7.37	63				
14/03/2023	MW226	0089_MW226_230314	0.75-3.8_	1.749	3.8	14:24	1.62	0.129		HydraSleeve	22.8	0.71	36780	24957	6.39	-66.2		yes	Hydrogen sulfide	Brown
14/03/2023	MW227	0089_MW227_230314	1.25-4.2_	2.961	4.2	13:26	2.85	0.111	Quite turbid	HydraSleeve	24.1	1.03	3625	2396	7.03	-176.7		yes	Sulfur smell	Clear
14/03/2023	MW228	0089_MW228_230314	0.75-3.75_	2.23	3.75	13:11	2.13	0.1		HydraSleeve	23.8	1.67	1454	14571	6.84	-88.1		yes	Sulfur smell	Clear
13/03/2023	MW233	0089_MW233_230313	NA	3.705	4.968	13:31	3.355	0.35		HydraSleeve	19.7	2.52	331.7	215.6	8.32	23.6		no		Clear
13/03/2023	MW236		NA	4.642	5.66	11:30			Dry	HydraSleeve										
15/03/2023	MW238	0089_MW238_230315	NA	4.827	NA	10:12	4.47	0.357		HydraSleeve	21.8	0.97	764	497	7.59	89.2		no		Clear
15/03/2023	MW239	0089_MW239_230315	NA	4.03	NA	10:23	3.69	0.34	Stockpile earthworks appear completed. bore no longer at risk	HydraSleeve	23.1	3.8	732	476	7.7	93.5		no		Cloudy
15/03/2023	MW240	0089_MW240_230315	NA	4.483	6.8	10:00	4.11	0.373		HydraSleeve	22.7	1.77	878	570	7.45	78		no		Cloudy
15/03/2023	MW242	0089_MW242_230315	NA	3.539	4.76	10:43	3.23	0.309		HydraSleeve	24.4	1.95	450.9	293	7.77	30.6		no		Clear
15/03/2023	MW243	0089_MW243_230315	NA	4.892	7.0	09:51	4.55	0.342		HydraSleeve	21.3	2.03	969	630	7.49	58.8		no		Cloudy
15/03/2023	MW245	0089_MW245_230315	NA	4.551	5.65	09:41	4.23	0.321		HydraSleeve	20.4	1.76	627	407.8	7.35	-104.3		yes	Hydrocarbons	Clear
13/03/2023	MW249	0089_MW249_230313	3.5-6.5_	5.227	6.5	13:44	4.995	0.232		HydraSleeve	22.3	1.42	1298	844	7.41	-94.6		no		Clear
13/03/2023	MW255	0089_MW255_230313	3-6_	4.609	6.0	13:09	4.16	0.449		HydraSleeve	21.8	1.5	844	549	7.58	90.5		no		Clear
13/03/2023	MW256	0089_MW256_230313	3-6_	3.84	6.0	12:59	3.23	0.61		HydraSleeve	21.1	1.95	1664	1081	7.12	107.2		no		Clear
13/03/2023	MW257	0089_MW257_230313	2.7-5.7_	3.806	5.7	12:17	3.39	0.416		HydraSleeve	23.4	4.75	569	369.7	7.79	118.4		no		Clear
13/03/2023	MW258	0089_MW258_230313	3-6_	4.043	6.0	12:29	3.57	0.473	HydraSleeve Didn't fill up during recovery	HandBailing	22.7	2.58	1364	887	7.1	41.7		no		Cloudy
13/03/2023	MW259	0089_MW259_230313	2.5-5.5_	3.8	5.5	12:44	3.28	0.52		HydraSleeve	21.9	2.11	494	321.1	7.23	80.9		no		Clear
15/03/2023	MW268	0089_MW268_230315	2.5-5.5_	4.056	5.5	11:23	3.895	0.161		HydraSleeve	23.2	1.93	5919	3847	7.19	48.4		no		Clear
15/03/2023	MW269	0089_MW269_230315	2.5-5.5_	4.153	5.5	11:11	4.01	0.143		HydraSleeve	22.5	1.37	1744	1134	7.41	-127.1		no		Clear
15/03/2023	MW282	0089_MW282_230315	4.5-7.5_	5.78	7.5	08:57	5.4	0.38	Insufficient water in Sleeve to take field readings	HydraSleeve										
14/03/2023	MW288	0089_MW288_230314	2.25-5.25_	4.003	5.25	09:30	3.84	0.163		HydraSleeve	23.7	0.88	790	527	6.65	-199.6		yes	Sulfur smell	Cloudy
14/03/2023	MW289	0089_MW289_230314	3.25-6.25_	4.495	6.25	09:02	4.2	0.295		HydraSleeve	24.2	0.86	1188	784	6.62	-94.1		no		Cloudy
13/03/2023	MW496	0089_MW496_230313	3.5-8_	5.092	8.0	14:12	4.96	0.132		HydraSleeve	22	0.88	1485	965	7.54	-216.6		yes	Slight H2S	Clear
13/03/2023	MW500	0089_MW500_230313	2-6.5_	3.692	6.5	10:41	3.33	0.362		HydraSleeve	22.7	1.5	997	647	7.19	113.1		no		Clear
13/03/2023	MW516	0089_MW516_230313	4.5-7.5_	6.37	7.5	13:59	6.15	0.22		HydraSleeve	21.8	1.84	1082	704	7.3	-88.3		no		Clear

Monitoring Date	Monitoring Location ID	Sample_ID	Other Observations on Bore/Site	Purge Method	Reading 1 time	R1 - Temp (°C)	R1 - DO (mg/L)	R1 - EC (us/Cm)	R1 - TDS (mg/L)	R1 - pH	R1 - Eh (mV)	Reading 2 time	R2 - Temp (°C)	R2 - DO (mg/L)
13/03/2023	PW304	0089_PW304_230313		Peristaltic Pump	13:42	28	1.85	57879	35552	7.1	-106.1	13:46	28.1	1.78
14/03/2023	PW306	0089_PW306_230314		Peristaltic Pump	14:02	23.9	2.65	57044	37005	7.88	79.7	14:06	23.8	2.51
14/03/2023	PW307	0089_PW307_230314		Peristaltic Pump	14:29	24	3.23	56722	36855	7.59	83.4	14:33	23.9	4.44
14/03/2023	PW308	0089_PW308_230314		Peristaltic Pump	14:41	24.2	4.48	56712	36855	7.94	78	14:45	24.2	4.45
14/03/2023	PW314	0089_PW314_230314		Peristaltic Pump	14:05	23.9	3.92	57209	37180	7.52	84.3	14:09	23.9	3.93
14/03/2023	PW315	0089_PW315_230314		Peristaltic Pump	14:26	24	3.39	57118	37115	7.51	84.4	14:30	24	3.26
14/03/2023	PW316	0089_PW316_230314		Peristaltic Pump	14:39	24	3.54	56679	36855	8.12	84.4	14:43	24	3.43
15/03/2023	PW329	0089_PW329_230315		Peristaltic Pump	10:24	24.3	3.42	51345	33775	7	-3.5	10:28	24.4	3.24
15/03/2023	PW330	0089_PW330_230315		Peristaltic Pump	10:05	25.1	3.45	51658	33533	7.2	-4.6	10:09	25.1	3.29
15/03/2023	PW331	0089_PW331_230315		Peristaltic Pump	09:25	22.9	1.23	49429	33490	6.64	-215	09:29	22.9	1.23
13/03/2023	PW335	0089_PW335_230313		Peristaltic Pump	09:45	22.7	1.31	33428	28828	6.94	-170.7	09:49	22.8	1.29
13/03/2023	PW340	0089_PW340_230313	Very turbid, lots of seaweed	Peristaltic Pump	10:33	23.8	0.15	58042	38592	6.65	-325.6	10:37	24	0.09
13/03/2023	PW341	0089_PW341_230313		Peristaltic Pump	11:24	26.5	3.01	53901	34046	7.25	-92.6	11:28	26.5	3.0
14/03/2023	PW345	0089_PW345_230314		Peristaltic Pump	10:09	23.3	1.11	64393	41860	7.44	-87.9	10:13	23.3	0.91
14/03/2023	PW346	0089_PW346_230314		Peristaltic Pump	10:13	26.7	0.11	60150	38055	6.55	-344.5	10:17	26.8	0.11
15/03/2023	PW350	0089_PW350_230316	Labelled SW350 in CoC	Peristaltic Pump	10:04	23.8	4.82	56568	36790	7.98	72.5	10:08	23.8	4.81
15/03/2023	PW351	0089_PW351_230316		Peristaltic Pump	10:32	23.5	5.22	55097	35815	8	78.8	10:36	23	5.22
15/03/2023	PW352	0089_PW352_230316		Peristaltic Pump	10:37	25.1	4.54	55813	36270	7.97	79.2	10:41	25.1	4.54
15/03/2023	PW356	0089_PW356_230315		Peristaltic Pump	09:15	21.9	1.62	45573	31799	6.26	-226	09:19	22	1.36
15/03/2023	PW357	0089_PW357_230315		Peristaltic Pump	09:49	24.8	3.27	51640	33961	7.03	-27.2	09:53	24.9	3.16
15/03/2023	PW358	0089_PW358_230315		Peristaltic Pump	10:14	24.1	3.21	51075	33804	6.99	-72.5	10:18	24.1	3.09
13/03/2023	PW362	0089_PW362_230313	Turbid, lots of seaweed	Peristaltic Pump	11:04	24.8	0.79	59985	39038	6.67	-182.1	11:08	24.9	0.78
13/03/2023	PW363	0089_PW363_230313		Peristaltic Pump	12:02	24.7	1.06	58043	37961	6.83	-231.7	12:06	24.7	1.02
13/03/2023	PW364	0089_PW364_230313		Peristaltic Pump	10:03	23.9	0.9	45842	32399	6.85	-82.4	10:07	0.85	1.09
14/03/2023	PW367	0089_PW367_230314		Peristaltic Pump	10:31	23.6	0.73	59573	38740	7.33	30.2	10:35	23.7	0.7
13/03/2023	PW368	0089_PW368_230313		Peristaltic Pump	13:58	24.8	0.5	60502	39395	6.3	-367.2	14:02	25	0.49
14/03/2023	PW369	0089_PW369_230314		Peristaltic Pump	09:50	22.4	1.23	69396	45110	7.34	-66.7	09:54	22.4	1.06
14/03/2023	PW374	0089_PW374_230314		Peristaltic Pump	11:53	26.8	3.72	54120	34043	7.3	-70.7	11:57	26.7	3.7
14/03/2023	PW375	0089_PW375_230314		Peristaltic Pump	11:32	27.4	4.86	33819	21021	7.23	-90.7	11:36	27.4	4.83
14/03/2023	PW378	0089_PW378_230314		Peristaltic Pump	11:12	28.6	5.49	25721	16066	7.31	-127.1	11:16	28.6	5.48
16/03/2023	PW380	0089_PW380_230316		Peristaltic Pump	10:26	24.1	5.12	56621	36790	7.84	75.9	10:30	24.1	5.12
16/03/2023	PW381	0089_PW381_230316		Peristaltic Pump	10:34	23.6	5.27	55097	35815	8	78.8	10:38	23.6	5.27
16/03/2023	PW401	0089_PW401_230316		Peristaltic Pump	10:12	23.8	6.17	56380	36595	8.11	79.2	10:16	23.8	5.98
14/03/2023	PW405	0089_PW405_230314		Peristaltic Pump	14:04	27.9	3.02	54804	33683	7.24	-29.1	14:08	28.1	2.98
14/03/2023	PW407	0089_PW407_230314		Peristaltic Pump	13:52	27.2	3.11	50222	31313	7	-64.7	13:56	27.3	3.06
14/03/2023	PW409	0089_PW409_230314		Peristaltic Pump	14:37	26.1	4.01	33087	21070	6.77	-15	14:41	26.1	3.94
15/03/2023	PW411	0089_PW411_230315		Peristaltic Pump	13:39	25.1	4.18	57081	37115	7.48	84.9	13:43	25.2	3.74
15/03/2023	PW413	0089_PW413_230315		Peristaltic Pump	13:32	25.1	4.69	57085	37115	7.72	82.1	13:36	25.1	4.15
15/03/2023	PW415	0089_PW415_230315		Peristaltic Pump	13:26	25	4.84	56701	36920	7.85	78.5	13:30	25.2	4.31

Monitoring Location ID	R2 - EC (us/Cm)	R2 - TDS (mg/L)	R2 - pH	R2 - Eh (mV)	Reading 3 time	R3 - Temp (°C)	R3 - DO (mg/L)	R3 - EC (us/Cm)	R3 - TDS (mg/L)	R3 - pH	R3 - Eh (mV)	QC Dup Sample #	Odour ?	Odour Comments	Colour
PW304	58073	35602	7.1	-104.6	13:50	28.3	1.72	58303	35647	7.1	-103.5	QC115/215	no		Clear
PW306	56849	36920	7.88	82.4	14:10	23.8	2.48	56851	36920	7.88	82.4		no		Clear
PW307	56681	36855	7.59	83.8	14:37	24	4.14	56870	36855	7.59	84		no		Clear
PW308	56712	36855	7.94	78	14:49	24	4.48	56713	36855	7.94	78		no		Clear
PW314	57138	37115	7.52	84.4	14:13	23.9	3.79	57136	37115	7.51	84.4		no		Clear
PW315	57130	37115	7.51	84.4	14:34	23.9	3.18	57129	37115	7.51	84.5		no		Clear
PW316	56668	36855	8.12	84.5	14:47	24	3.38	53657	36855	8.12	84.5		no		Clear
PW329	51375	33747	7	-3.3	10:32	24.5	3.04	51388	33742	7.0	-3		no		Clear
PW330	51699	33543	7.2	-4.3	10:13	25.1	3.17	51730	33560	7.2	-4.1		no		Clear
PW331	49478	33509	6.65	-213.1	09:33	22.9	1.22	49518	33520	6.66	-209.5		no		Clear
PW335	33429	28829	6.94	-169.3	09:53	22.8	1.27	33435	28231	6.93	-154.3		yes	Hydrogen sulfide smell	Clear
PW340	58220	38560	6.68	-327.3	10:41	24.1	0.08	58274	38555	6.69	-327.7		yes	Hydrogen sulfide	Clear
PW341	53915	34047	7.26	-91.6	11:32	26.5	3	53937	34050	7.26	-91.3		no		Clear
PW345	64410	41860	7.44	-88.4	10:17	23.4	0.81	64413	41860	7.44	-88.9		no		Clear
PW346	60155	38060	6.56	-346.3	10:21	26.8	0.1	60160	38062	6.57	-348.3	QC118/218	no		Clear
PW350	56568	36790	7.98	72.3	10:12	23.8	4.8	56568	36790	7.98	72.2		no		Clear
PW351	55097	35815	8.01	78.8	10:40	23	5.22	55097	35815	8.01	78.8		no		Clear
PW352	55813	36270	7.97	79.2	10:45	25.1	4.54	55813	36270	7.97	79.2		no		Clear
PW356	45793	31789	6.28	-227	09:23	22.1	1.24	46165	31780	6.35	-232		no		Clear
PW357	51861	33710	7.04	-26.5	09:57	25.1	3.03	52087	33727	7.04	-25.9		no		Clear
PW358	51187	33845	7	-65	10:22	24.2	2.97	51274	33876	7.0	-60.5		no		Clear
PW362	59951	39044	6.68	-180.1	11:12	25	0.73	60043	39053	6.69	-178.2	QC109/209	yes	Hydrogen sulfide	Clear
PW363	58104	37974	6.83	-231.5	12:10	24.8	0.97	58173	37990	6.83	-230.7		no		Clear
PW364	45842	32263	6.84	-87	10:11	23.9	0.83	45869	32261	6.86	-76.5	QC106/206	yes	Hydrogen sulfide	Clear
PW367	59591	38740	7.33	31	10:39	23.8	0.68	59585	38740	7.33	31.6		no		Clear
PW368	60737	39421	6.32	-368.8	14:06	25.2	0.49	60951	39453	6.33	-370.8		yes	Strong hydrogen sulfid	Brown
PW369	69280	45045	7.35	-66.2	09:58	22.3	1.07	69257	44980	7.34	-68.2		no		Clear
PW374	54056	34042	7.29	-70.3	12:01	26.6	3.67	54052	34041	7.28	-69.5		no		Clear
PW375	33807	21011	7.23	-89.5	11:40	27.4	4.8	33806	21015	7.24	-88.5		no		Clear
PW378	25733	16074	7.31	-122.9	11:20	28.7	5.46	25742	16079	7.32	-121.4		no		Clear
PW380	56621	36790	7.84	75.9	10:34	24.1	5.12	56621	36790	7.84	75.9		no		Clear
PW381	55097	35815	8	78.8	10:42	23.6	5.27	55097	35815	8.0	78.8		no		Clear
PW401	56380	36595	8.1	78.8	10:20	23.8	9.95	56380	36595	8.1	78.5		no		Clear
PW405	54872	33698	7.25	-28.8	14:12	28.1	2.96	54952	33712	7.25	-28.7		no		Clear
PW407	50273	31308	7	-60.8	14:00	27.3	3.02	50321	31303	7.0	-58.3		no		Clear
PW409	33108	21075	6.77	-14.5	14:45	26.1	3.86	33119	21074	6.77	-14		no		Clear
PW411	57160	37180	7.47	84.9	13:47	25.3	3.46	57239	37180	7.47	84.9		no		Clear
PW413	57108	37115	7.72	82.2	13:40	25.1	3.9	57113	37115	7.72	82.3		no		Clear
PW415	56919	37050	7.85	78.9	13:34	25.3	4	57115	37180	7.85	79.3		no		Clear

Monitoring Location ID	Date	Sample ID	Sampling Method	Sample Depth (m)	WaterBody Depth (m)	QC Dup Sample #	Temperature °C	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Water Colour	Turbidity
SW370	14/03/2023	0089_SW370_230314	Direct_into_Bottle	0.2	1.0		24	1.36	56612	36790	7.56	-42.7	Clear	Medium
SW309	14/03/2023	0089_SW309_230314	Direct_into_Bottle	0.2	1.0		25.3	4.58	56717	36855	8.13	95.6	Clear	Medium
SW310	14/03/2023	0089_SW310_230314	Direct_into_Bottle	0.2	1.0		24.6	4.35	56620	36790	8.13	79.8	Clear	Medium
SW311	14/03/2023	0089_SW311_230314	Direct_into_Bottle	0.2	1.0		24.8	4.44	56490	36725	8.17	82.3	Clear	Medium
SW130	13/03/2023	0089_SW130_230313	Direct_into_Bottle	0.1	1.0	QC102/202	23.3	2.51	60356	40615	7.11	-90.8	Clear	Medium
SW134	13/03/2023	0089_SW134_230313	Direct_into_Bottle	0.1	1.0		26.2	3.5	53421	33918	7.15	-106.6	Clear	Low
SW305	13/03/2023	0089_SW305_230313	Direct_into_Bottle	0.1	1.0	QC114/214	26.8	5.44	51790	32563	7.13	-107.2	Clear	Low
SW371	13/03/2023	0089_SW371_230313	Direct_into_Bottle	0.1	1.0		27.9	3.2	54860	33772	7.34	-262.5	Clear	Medium
SW373	14/03/2023	0089_SW373_230314	Direct_into_Bottle	0.1	1.0	QC116/216	26.2	2.09	50749	32219	7	-18.6	Brown	High
SW372	14/03/2023	0089_SW372_230314	Direct_into_Bottle	0.1	1.0		26	2.83	52732	33570	7.26	-241.6	Brown	High
SW317	14/03/2023	0089_SW317_230314	Direct_into_Bottle	0.1	1.0		28.3	5.01	55378	33851	7.42	-143.9	Clear	Low
SW318	14/03/2023	0089_SW318_230314	Direct_into_Bottle	0.1	1.0		25.2	4.91	51496	33356	7.32	-79.5	Clear	Low
SW319	14/03/2023	0089_SW319_230314	Direct_into_Bottle	0.1	1.0		24.5	4.67	50868	33396	7.29	-62.3	Clear	Low
SW408	14/03/2023	0089_SW408_230314	Direct_into_Bottle	0.1	1.0		27	3.54	53008	33177	7.16	-42.1	Clear	Low
SW406	14/03/2023	0089_SW406_230314	Direct_into_Bottle	0.1	1.0		26.7	3.91	53550	33711	7.21	-25.6	Clear	Low
SW410	14/03/2023	0089_SW410_230314	Direct_into_Bottle	0.1	1.0		27.1	5.77	53644	33519	7.23	-15.5	Clear	Low
SW150	15/03/2023	0089_SW150_230315	Direct_into_Bottle	0.1	1.0		24.1	4.23	50461	33364	6.94	95.8	Clear	Medium
SW152	15/03/2023	0089_SW152_230315	Direct_into_Bottle	0.1	1.0		26.9	3.32	53025	33255	7.12	-92.2	Clear	Medium
SW154	15/03/2023	0089_SW154_230315	Direct_into_Bottle	0.1	1.0		25.1	2.89	51507	33439	7.19	-7.5	Clear	Medium
SW156	15/03/2023	0089_SW156_230315	Direct_into_Bottle	0.1	1.0		24.7	3.77	50970	33339	7.14	0.2	Clear	High
SW416	15/03/2023	0089_SW416_230315	Direct_into_Bottle	0.1	1.0		26.4	5.31	56808	36920	8.25	73	Clear	Medium
SW414	15/03/2023	0089_SW414_230315	Direct_into_Bottle	0.1	1.0		25.9	5.9	56578	36790	8.27	80.1	Clear	Low
SW412	15/03/2023	0089_SW412_230315	Direct_into_Bottle	0.1	1.0		26.1	5.53	56280	36595	8.27	82.2	Clear	Low
SW353	15/03/2023	0089_SW353_230316	Direct_into_Bottle	0.1	1.0		24.2	4.56	56304	36595	8.11	74	Clear	Low
SW384	15/03/2023	0089_SW384_230316	Direct_into_Bottle	0.1	1.0		24	4.65	56847	36595	7.13	72.1	Clear	Low
SW383	15/03/2023	0089_SW383_230316	Direct_into_Bottle	0.1	1.0		23.6	4.38	56348	36595	8.15	74.8	Clear	Low
SW382	15/03/2023	0089_SW382_230316	Direct_into_Bottle	0.1	1.0		24	5.39	56503	36725	8.14	75.4	Clear	Low
SW132	13/03/2023	0089_SW132_230313	Direct_into_Bottle	0.1	1.0		24.9	2.88	52004	33876	7.01	-225.1	Clear	Medium

Monitoring Site ID	Date	Sample ID	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description	QC Dup Sample #
SD369	14/03/2023	0089_SD369_230314	0.2	Shovel, Trowel	Wet	Grey coarse sand	
SD345	14/03/2023	0089_SD345_230314	0.2	Shovel, Trowel	Wet	Grey coarse sand	
SD367	14/03/2023	0089_SD367_230314	0.5	Shovel, Trowel	Wet	Grey coarse sand	
SD306	14/03/2023	0089_SD306_230314	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand	
SD314	14/03/2023	0089_SD314_230314	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand	
SD315	14/03/2023	0089_SD315_230314	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand	
SD307	14/03/2023	0089_SD307_230314	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand	
SD316	14/03/2023	0089_SD316_230314	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand	
SD308	14/03/2023	0089_SD308_230314	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand	
SD335	13/03/2023	0089_SD335_230313	0.5	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, grey to beige, trace organics	QC104/204
SD364	13/03/2023	0089_SD364_230313	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, grey to beige, trace organics	
SD340	13/03/2023	0089_SD340_230313	0.5	Shovel, Trowel	Wet	Sand, fine to med grained, grey to beige, trace organics	QC108/208
SD362	13/03/2023	0089_SD362_230313	0.5	Shovel, Trowel	Wet	Sand, fine to med grained, trace organics	
SD341	13/03/2023	0089_SD341_230313	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, beige, trace organics	
SD363	13/03/2023	0089_SD363_230313	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, trace organics, beige	QC112/212
SD304	13/03/2023	0089_SD304_230313	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells, trace organics	
SD368	13/03/2023	0089_SD368_230313	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, grey to beige, trace organics	
SD346	14/03/2023	0089_SD346_230314	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, beige to grey, trace organics	QC117/217
SD378	14/03/2023	0089_SD378_230314	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells, trace organics	
SD375	14/03/2023	0089_SD375_230314	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, beige, trace shells	
SD374	14/03/2023	0089_SD374_230314	0.5	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells	
SD407	14/03/2023	0089_SD407_230314	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells	
SD405	14/03/2023	0089_SD405_230314	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells	
SD409	14/03/2023	0089_SD409_230314	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, trace organics, beige, trace shells	
SD356	15/03/2023	0089_SD356_230315	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, grey to beige, trace organics	
SD331	15/03/2023	0089_SD331_230315	0.3	Shovel, Trowel	Wet	Sand, fine to coarse grained, beige to grey, trace shells, trace organics	
SD357	15/03/2023	0089_SD357_230315	0.3	Shovel, Trowel	Wet	Sand, fine to coarse grained, well graded, beige, trace shells	
SD330	15/03/2023	0089_SD330_230315	0.4	Shovel, Trowel	Wet	Sand, fine to coarse grained, beige, trace shells, trace organics	
SD358	15/03/2023	0089_SD358_230315	0.4	Shovel, Trowel	Wet	Sand, fine to coarse grained, beige, trace shells	
SD329	15/03/2023	0089_SD329_230315	0.4	Shovel, Trowel	Wet	Sand, fine to coarse grained, beige, trace shells, trace organics	
SD415	15/03/2023	0089_SD415_230315	0.1	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells	
SD413	15/03/2023	0089_SD413_230315	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells, trace organics	
SD411	15/03/2023	0089_SD411_230315	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, beige to grey, trace shells	
SD350	15/03/2023	0089_SD350_230315	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand	
SD401	15/03/2023	0089_SD401_230315	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand	
SD380	15/03/2023	0089_SD380_230315	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand	
SD351	15/03/2023	0089_SD351_230315	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand	
SD381	15/03/2023	0089_SD381_230315	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand	
SD352	15/03/2023	0089_SD352_230315	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand	

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Stantec
Contact: [redacted]

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 22F101914
Cable length: 1m (22B100428)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	170.70 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 57.14
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 7 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (22B100314)	Check Temp NATA	Room Temp	23.1	-0.1	°C	NA	23	°C
pH (22D)	pH 7.00	375757	7.01	-5.40	mV	7.02	7.01	pH
pH (22D)	pH 4.00	378281	4.00	165.30	mV	4.08	4.00	pH
Conductivity (22B100314)	2764 µs/cm at 25°C	21/1012	2764	GLP	5.05	2778	2764	µs/cm
ORP (22B)	Zobell A & B	22/0309	233	233	mV	224.4	226	mV
Zero DO (22A100300)	NaSO3 in distilled water	10175	0.0	NA	NA	0.4	0.0	%
100% DO (22A100300)	100% Air Saturation	Air	100.0	5.8	uA	84.8	100.0	%

Calibrated by: [redacted]

Calibration Date: 08-Mar-23
Next Due: 04-Sep-23

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 20D101040
Cable length: 1m 20B140029

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	172.30 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 57.64
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV -2 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Check Temp NATA	Room Temp	23.6	-0.2	°C	NA	23.4	°C
pH (22M)	pH 7.00	375757	7.01	-3.80	mV	7.06	7.01	pH
pH (22M)	pH 4.00	378281	4.00	168.50	mV	4.08	4.00	pH
Conductivity (20A100065)	2764 µs/cm at 25°C	21/1012	2764	GLP		4.98	2792	2764 µs/cm
ORP (200408SIA605101)	Zobell A & B	22/0309	233	233	mV	212.7	234.1	mV
Zero DO (20C100608)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.5	0.0	%
100% DO (20C100608)	100% Air Saturation	Air	100.0	6.03	uA	98.1	100.0	%

Calibrated by: [redacted]

Calibration Date: 28-Feb-23
Next Due: 27-Aug-23

Stantec

Calibration Report

Multi-Parameter Water Quality Instrument

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 21G105325
Cable length: 4m (21F100778)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Needs spares
	Battery Saver	✓	
Connections	Condition	✓	
Cable	Condition	✓	Becoming worn
Display	Operation	✓	
Firmware	Version	✓	
Keypad	Operational	✓	
Display	Screen	✓	Becoming worn
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	
pH slope		✓	
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	
Conductivity			
Condition		✓	
Temperature		✓	
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

				Instrument Readings				
Parameter	Standards	Calibration Point	Units	Before		After		Units
Temperature	Check Temp NATA	—	°C	NA		21.37		°C
pH 21G	pH 7.00	7.01	mV	6.92		7.0		pH
pH 21G	pH 4.00	4.00	mV	4.5		4		pH
Conductivity (21H100008) 1413	~~2764~~ µs/cm at 25°C	~~2764~~ 1413	5.03	36,899		35,000		µs/cm
ORP (Reference check only) 210	Zobell A & B	~~235~~ 229	mV	223.5		229		mV
Zero DO (21G100131)	NaSO3 in distilled water	0.0	NA	0.0		0.0		%
100% DO (21G100131)	100% Air Saturation	100.0	uA	100		100		%

Calibrated by: [redacted] **Calibration Date:** 10/3/23

Date of Bump Test	Site ID	Unit Brand/ Model	Ambient Air Oxygen Calibration	Zero % Oxygen Solution Calibration	Standard Concentrations	Ambient Temperature (°C)	Bump Test Reading	Bump Test Readings within ±5%?	Comment	Test by (Name)	(Signature)
14/3/23	0089-Stirling	YSI #21G105325	100% Saturation? Y / N	0% Calibration? Y / N / NA	pH 4.00 Y / N pH 7.00 Y / N EC: ~~1,413µS/cm~~ 2,760 35,000 Y / N	21°C	pH 4.00: 4.10 pH 7.00: 6.58 EC: 2,665 34,980	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N	N.I.	[redacted]	
14/3/23	0089-Stirling	YSI #20D10040	100% Saturation? Y / N	0% Calibration? Y / N / NA	pH 4.00 Y / N pH 7.00 Y / N EC: ~~1,413µS/cm~~ 2,760 35,000 Y / N	20.8°C	pH 4.00: 4.01 pH 7.00: 7.01 EC: 2864 34,888	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N	Nil.		
15/3/23	0089-Stirling	YSI #22F101916	100% Saturation? Y / N	0% Calibration? Y / N / NA	pH 4.00 Y / N pH 7.00 Y / N EC: ~~1,413µS/cm~~ 2,760 35,000 Y / N	19.6°C	pH 4.00: 4.05 pH 7.00: 7.04 EC: 2979 35,089	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N	n.i.		
15/3/23	0089-Stirling	YSI #21G105325	100% Saturation? Y / N	0% Calibration? Y / N / NA	pH 4.00 Y / N pH 7.00 Y / N EC: ~~1,413µS/cm~~ 2,760 35,000 Y / N	18.7°C	pH 4.00: 4.01 pH 7.00: 6.90 Temp: 2,608 EC: 35,989	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N	n.i.		
15/3/23	0089-Stirling	YSI #20D10040	100% Saturation? Y / N	0% Calibration? Y / N / NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm ~~2,760~~ ~~35,000~~ Y / N	20.7	pH 4.00: 4.05 pH 7.00: 6.99 Temp: 2.735 EC: 36,912	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N	n.i.		
		YSI #	100% Saturation? Y / N	0% Calibration? Y / N / NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y / N	0% Calibration? Y / N / NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y / N	0% Calibration? Y / N / NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			

APPENDIX

E

DATA QUALITY REVIEW

Cardno

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Data Quality Review
PFAS Ongoing Monitoring Plan
Q1 2023 Monitoring Event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as trip blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

QA/QC Aspects	Evidence & Evaluation
	QA Documentation
Project Quality Plan/Work Plan and Data Quality Objectives	The field investigation was carried out between the 13th and 15th March 2023 and is generally in accordance with the proposed scope of work, as documented in the SAQP (PFAS OMP SAQP HMAS Stirling, Cardno, February 2022, Rev9) issued to the client and in general compliance with Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling,* NEPM "*National Environment Protection (Assessment of Site Contamination) Measure"* and PFAS NEMP 2.0. A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (PFAS OMP Q1 2023 Factual Report). In addition, a safety, health and environment work method statement (SHEWMS) was also prepared. The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.
	Data Representativeness
Use of Composites	No Composites were used during the investigation
Holding Times	Chain of custody and laboratory reports provide evidence of holding times. Holding times were in compliance with required timeframes.
Verification of field procedures	The methodology conducted during this investigation is documented in the body of the report and was in general conformance with the SAQP. Non-disposable equipment was decontaminated between sample locations.
Laboratory Reports	The following laboratory reports were considered for this data quality review: ▪ ALS reports: EP2303084, EP2303085, EP2303086, EP2303087, EP2303119, EP2303175, EP2303176, EP2303177, EP2303178, EP2303179, EP2303180, EP2303198, EP2303226, EP2303227, EP2303228, EP2303229. ▪ Eurofins report: 972487

<table>
<tr><th>QA/QC Aspects</th><th>Evidence & Evaluation</th></tr>
<tr><td colspan="2">Data Precision & Accuracy</td></tr>
<tr><td>QC sample Frequency</td><td>
<table>
<tr><th>QC sample type</th><th>SAQP required frequency</th><th>Sample Collected</th></tr>
<tr><td>Blind duplicate</td><td>1 in 10 primary samples (10%)</td><td>7 for 60 groundwater samples (11.7%)
4 for 39 porewater samples (10.3%)
3 in 28 surface water samples (10.7%)
4 in 39 sediment samples (10.3%)</td></tr>
<tr><td>Interlab duplicate</td><td>1 in 10 primary samples (10%)</td><td>7 for 60 groundwater samples (11.7%)
4 for 39 porewater samples (10.3%)
3 in 28 surface water samples (10.7%)
4 in 39 sediment samples (10.3%)</td></tr>
<tr><td>Rinsate</td><td>1 per field crew per day</td><td>8 for 3 days (2 to 3 field personnel/day) (100%)</td></tr>
<tr><td>Field Blank</td><td>1 per field crew per day</td><td>8 for 3 days (2 to 3 field personnel/day) (100%)</td></tr>
</table>
The required QC frequency was achieved for all sample types.</td></tr>
<tr><td>RPD Acceptance criteria</td><td>
<table>
<tr><th>Magnitude of Results</th><th>Acceptable RPD range</th></tr>
<tr><td>< 10 x LOR</td><td>No limits</td></tr>
<tr><td>10 – 20 LOR</td><td>0% - 50%</td></tr>
<tr><td>> 20 x LOR</td><td>0% - 20%</td></tr>
</table></td></tr>
<tr><td>QC Testing – Blind Duplicates (Primary Lab)</td><td>
Groundwater
▪ Primary Groundwater Samples Analysed: 60
▪ Blind Duplicate Samples Analysed: 7
RPDs were within acceptance criteria with the following exceptions:
▪ QC103 (PFHxS – 96%)
▪ QC105(PFHpS – 81%, PFOS - 35%, PFOA – 72%)
▪ QC107 (PFHxS – 21%)
These minor RPDs differences are likely due to the low concentrations of analytes under review. This is not considered to have impacted the validity of the interpretation drawn upon this dataset.
Porewater
▪ Primary porewater Samples Analysed: 39
▪ Blind Duplicate Samples Analysed: 4
All RPDs were within acceptance criteria with the following exception:
▪ QC118 (PFOS – 60%).
This minor RPDs difference is likely due to the low concentrations of analytes under review. This is not considered to have impacted the validity of the interpretation drawn upon this dataset.
Surface water
▪ Primary surface water Samples Analysed: 28
▪ Blind Duplicate Samples Analysed: 3
All RPDs were within acceptance criteria.</td></tr>
</table>

QA/QC Aspects	Evidence & Evaluation
	Sediment ▪ Primary Sediment Samples Analysed: 39 ▪ Blind Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria.
QC Testing – Interlab Duplicates (Secondary Lab)	***Groundwater*** ▪ Primary Groundwater Samples Analysed: 60 ▪ Interlab Duplicate Samples Analysed: 7 RPDs were within acceptance criteria with the following exceptions: ▪ QC203 (PFHxS – 120%) ▪ QC205 (PFHpS – 99%, PFOS – 57%, PFOA – 40%) ▪ QC207 (PFHxS – 24%, PFHxA – 25%) These RPDs difference are likely due to the differences of methodologies between the primary and secondary laboratories and/or low concentrations of analytes under review. Concentrations were either higher for the primary sample (conservative value reported on) or of the same order of magnitude. This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Porewater*** ▪ Primary porewater Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 ▪ QC218 (PFOS – 27%). This minor RPDs difference is likely due to the low concentrations of analytes under review. This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Surface water*** ▪ Primary surface water Samples Analysed: 28 ▪ Interlab Duplicate Samples Analysed: 3 All RPDs were within acceptance criteria. ***Sediment*** ▪ Primary sediment Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria.
Field Blanks	Field Blanks were collected at a rate of one per fieldwork day. All field blank samples tested reported analytes below the laboratory limit of reporting.
Laboratory Internal QC	Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, matrix spikes, laboratory control samples and laboratory duplicates. All Method Blank, Laboratory Control and surrogate recovery results were within acceptable range. All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following: ▪ EP2303085, EP2303086, EP2303175, EP2303177, EP2303179, EP2303229: - Samples ID: Anonymous, SW130, SW370, SW353: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2303119: - Samples ID: MW500: PFPeS, PFHxS, PFHpS, PFOS, PFHxA and PFOA matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level. The following quality control samples frequency outliers were reported: ▪ EP2303119, EP2303198, EP2303226, EP2303229:

QA/QC Aspects	Evidence & Evaluation
	- Laboratory Duplicates: PFAS by LCMSMS, expected frequency 10% not achieved. - Matrix Spikes: PFAS by LCMSMS, expected frequency 5% not achieved. The above outliers/exceptions are not considered to affect the reliability of the dataset.
Laboratory Method Detection Limit	Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.
NATA endorsement of laboratory reports	Laboratory reports were stamped with the NATA endorsement stamp and signature. ALS Accreditation No. 825 Eurofins ARL Accreditation No. 1261
Calibration of Field Equipment	All equipment used during the investigation was calibrated by the supplier prior to use and daily readings of reference solutions (bump tests) were completed. The equipment calibration certificates, and daily field bump test records are provided in Appendix D.
Decontamination and Equipment Blanks	Rinsate blanks were collected at a rate of one per day per sampler when reusable equipment was used. All rinsate samples tested reported analytes concentrations below the laboratory LORs.
Data Comparability	
Standard Procedures	Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.
Qualified Personnel	Staff involved in managing and reviewing the project and those involved in fieldwork are experienced and qualified personnel.
Sample Integrity	Field Chain of Custody/Laboratory request forms can be found in Appendix C.
Data Completeness	
Completeness of test program	The scope of work undertaken was generally consistent with the SAQP.
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection process and therefore, the data set used as the basis for groundwater, surface water, porewater and sediment investigation is considered valid and complete.

PFAS OMP Quarterly Sampling Event Factual Report

June 2023

HMAS Stirling

304700525

Prepared for
Department of Defence

11 August 2023

Cardno

now

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0	12/07/2023	External Draft (Client review)	[redacted]	[redacted]
1	08/08/2023	Revision 1	[redacted]	[redacted]
2	11/08/2023	Revision 2	[redacted]	[redacted]

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Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

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Chemical Names

DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluorohexane Sulfonate
PFOA	Per-fluorooctanoic Acid
PFOS	Per-fluorooctane Sulfonate

Technical Terms

AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
AS	Australian Standard
BGL	Below Ground Level
CEC	Cation Exchange Capacity
COC	Chain of Custody
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
DWER	Department of Water and Environmental Regulation
EC	Electrical Conductivity
EPA	Environment Protection Authority
ERA	Ecological Risk Assessment
ESA	Environmental Site Assessment
HEPA	Heads of Environmental Protection Authority
LOR	Limit of Reporting
N/A	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEMP	National Environmental Management Plan
NEPM	National Environmental Protection Measure
ORP	Oxidation Reduction Potential
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
RWL	Reduced water levels
SAQP	Sampling and Analysis Quality Plan
SWL	Standing water level

Units

ha	Hectares
mAHD	Metres relative to the Australia Heigh Datum
mBGL	Metres Below Ground Level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
µg/L	Microgram per Litre
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity – Water)

Site Specific

OMP	Ongoing Monitoring Plan
FTA	Fire Training Area
HSF	Helicopter Support Facility

1 Introduction

1.1 Background

Cardno was engaged by the Australian Department of Defence ("the Client") to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) at HMAS Stirling ("the site"). The site is located on Garden Island, Western Australia.

The OMP was carried out in accordance with the scope and limitations presented in Cardno's Sampling and Analysis Quality Plan (SAQP):

> Cardno, February 2023, Reference: DEF19009, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling.* Rev 10.

The SAQP was reviewed and updated prior to the Q2 2023 monitoring event, and monitoring well MW496 was added to the groundwater monitoring network in replacement of nearby damaged well MW248.

For the purposes of this report:

> The Management Area was defined as comprising of Garden Island and the marine nearshore environment (Figure 1A, Appendix A).

1.2 Purpose & Objectives

The objective of the OMP is to assess the changes in the nature and extent of PFAS within the environment, specifically where there is an identified potentially elevated risk to a receptor or a potential future risk to a receptor associated with Defence's historical use of legacy Aqueous Film Forming Foam (AFFF).

The purpose of this PFAS OMP factual report is to provide an up-to-date status of the condition of the site as it is currently understood in relation to the most recent sampling event.

The objectives of the report are:

> To provide a succinct summary of the Q2 2023 sampling event and provision of analytical results with supporting tables and figures.

> To provide confirmation of the current understanding of risk.

> To provide supporting data for the assessment of management actions, where relevant.

1.3 Relevant Guidelines

This assessment has been undertaken in general accordance with applicable industry standards for a site investigation for the purpose, objectives and scope identified in this report. These standards are set out in:

> National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended 2013) (ASC NEPM).

> Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, *PFAS National Environmental Management Plan (NEMP) 2.0*.

> Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds*.

> Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling*.

> Australian and New Zealand Guidelines (ANZG), 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

> Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*[1].

[1] It is noted that the site is located on Commonwealth Land and is regulated under the Commonwealth environmental legislation, the State based DWER guidelines are relevant for the sampling of off-site properties and waterways.

> Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.

> U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*.

> U.S. EPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)*.

> National Health and Medical Research Council (NHMRC), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

2 Scope of Work

Cardno carried out the tasks detailed in the following sections in order to satisfy the purpose and objectives of this assessment. The PFAS source areas are shown on Figure 1B, Appendix A.

2.1 Groundwater Monitoring

Sampling of selected groundwater monitoring wells was performed in general accordance with the SAQP (Cardno, 2023), applying methods set out in Section 3 of this report. The groundwater wells monitored as part of the OMP are presented in Table 2-1, and are shown on Figures 2A and 2B, Appendix A.

Table 2-1 Groundwater Monitoring Locations

Monitoring Area	Location ID	No.
Demolition Ground	MW139, MW141, MW142, MW147, MW149	5
Fire Training Area	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128	11
Wastewater treatment plant	MW158, MW161, MW166, MW171, MW172, MW173, MW193, MW195D, MW195S, MW196, MW197, MW199, MW200, MW202, MW203	15
Accommodation Area	MW288, MW289	2
Dredged Sediments	MW268, MW269	2
AVCAT Storage and Fuel Farm	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW249, MW496, MW516	11
Fire Station, Flammable / Hazardous Goods and Waste Storage, Ship Sullage	MW255, MW256, MW257, MW258, MW259	5
Helicopter Support Facility	MW214, MW215, MW216, MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282	11

2.2 Porewater, Surface Water and Sediment Monitoring

Porewater, sediment and surface water sampling were performed in general accordance with the SAQP (Cardno, 2023), applying methods set out in Section 3 of this report. The porewater, surface water and sediment monitoring locations monitored as part of the OMP are presented in Table 2-2, and are shown on Figures 3A to 5B, Appendix A.

Table 2-2 Porewater, Surface Water and Sediment Monitoring Locations

Monitoring Area	Porewater Sampling Location ID	No.	Sediment Sampling Location ID	No.	Surface Water Sampling Location ID	No.
Demolition Ground	PW329, PW330, PW331, PW356, PW357, PW358	6	SD329, SD330, SD331, SD356, SD357, SD358	6	SW150, SW152, SW154, SW156	4
Fire Training Area	PW335, PW340, PW341, PW362, PW363, PW364	6	SD335, SD340, SD341, SD362, SD363, SD364	6	SW130, SW132, SW134	3
WWTP	PW304, PW345, PW367, PW368, PW369, PW350, PW351, PW352, PW380, PW381, PW401	11	SD304, SD345, SD367, SD368, SD369, SD350, SD351, SD352, SD380, SD381, SD401	11	SW305, SW370, SW371, SW372, SW373, SW353, SW382, SW383, SW384	9
Accommodation Area	PW346	1	SD346	1		
Dredged Sediments	PW374, PW375, PW378	3	SD374, SD375, SD378	3	SW317, SW318, SW319	3
Helicopter Support Facility	PW306, PW307, PW308, PW314, PW315, PW316, PW405, PW407, PW409, PW411, PW413, PW415	12	SD306, SD307, SD308, SD314, SD315, SD316, SD405, SD407, SD409, SD411, SD413, SD415	12	SW309, SW310, SW311, SW406, SW408, SW410, SW412, SW414, SW416	9

2.3 Data Management

All the data included in the report has been collected, uploaded, and reviewed according to the data management requirements of the *Defence Contamination Management Manual* (DCMM) Annex L (Defence, 2021), including:

- The sample naming convention detailed in the DCMM Annex L was used in the field;
- All field data collected was uploaded to the ESdat database;
- Laboratory data was uploaded and approved; and
- QA/QC data was reconciled.

2.4 Deviations from the OMP SAQP

Deviations from the SAQP for the Q2 2023 monitoring event are presented in Table 2-3 below.

Table 2-3 Deviations from OMP SAQP

Location	Deviation	Comments/Impact
MW121, MW233	No Standing water levels (SWL) recorded	SWL could not be recorded due to unreliable reading with the dip metre attributed to moisture in the well casing. No impact, nearby wells' SWL were used to draw inferred groundwater contours.
MW109, MW112, MW120, MW121, MW123, MW158, MW161, MW166, MW171, MW172, MW196, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW288, MW500 PW304, PW346, PW368 SW305, SW371, SW372, SW372	No field parameters recorded	Water Quality Meter 1 reader failed on day 1 of the monitoring event. WQM2 ran out of battery on day 2 of the monitoring event. Low impact on OMP, field parameters are not driving any major decisions. WQM1 was replaced on day 2 and WQM2 battery was changed on day 3.
SW383	Not Analysed	Sample was lost in the field. No impact on the OMP, adjacent locations were sampled, and this location has been monitored quarterly since the start of the program with only two samples recorded detectable PFAS concentrations in 2018 and 2020.

3 Methodology

3.1 Groundwater Sampling Methodology

Groundwater monitoring was generally undertaken by no purge HydraSleeve® method as detailed in Table 3-1.

Table 3-1 Groundwater Sampling Methodology

Activity	Details
Well Gauging	SWL were gauged using a dip meter. All wells were measured against a surveyed mark at the top of the well casing. Time of gauging was recorded on field records sheets.
Groundwater Field Parameters	Groundwater field parameters were recorded via a pre-calibrated water quality meter prior to deployment of HydraSleeves® or pre-sample collection. The following field parameters were recorded: ▪ pH ▪ electrical conductivity (EC) ▪ oxidation reduction potential (ORP) ▪ Dissolved oxygen (DO) ▪ Temperature Once field parameters were stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurements were recorded on field data records. All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and bump tested daily to optimise the accuracy of the measurements taken. Calibration certificates and bump test records are provided in Appendix D.
Deployment of HydraSleeve®	HydraSleeve® were deployed with top weight for sample collection to begin at the lowest point. Following Q2 2023 sampling, new HydraSleeve® were deployed in preparation for the next OMP monitoring event scheduled for Q3 2023, using the same string for consistency (same depth of sampling i.e. within screen depth).
Retrieval of HydraSleeve® (Sample Collection)	HydraSleeve® sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. HydraSleeve® used during Q2 2023 were the ones deployed following Q1 2023. Samples were collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples were discharged immediately (minimise changes in chemistry) via discharge tube.
Hand bailing (alternative sampling method)	Disposable HDPE hand bailers, attached to a polypropylene string, were used at wells where the water column wasn't sufficient to fill the HydraSleeve®. Purging of the well was undertaken prior to sampling to ensure that a sample representative of the aquifer is taken (i.e. removal of 3x well volume).
Decontamination procedure	Dedicated HydraSleeve® and HDPE hand bailers (single use and disposable) were used at each groundwater well thus removing the need for decontamination. All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample bottle was pre-labelled by the laboratory with a unique barcode. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). Where holding times did not comply, this is discussed in the data quality review in Appendix E.

Activity	Details
Quality Control	Groundwater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Groundwater samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance). The primary laboratory was ALS Global Laboratories (Perth), and the secondary laboratory (quality control) was Eurofins (Perth). Both laboratories are NATA-accredited for the parameters tested. Copies of the NATA stamped laboratory reports and CoC documentation are included in Appendix C.

3.2 Porewater and Sediment Sampling Methodology

The methodologies for sediment and porewater sampling are detailed in Table 3-2 and Table 3-3 respectively.

Table 3-2 Sediment Sampling Methodology

Item	Details
Sample Collection	Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.
Field Parameters	At each sampling location, the sediment sample was visually assessed, and observations (including physical description) were recorded on field data sheets.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Quality Control	Sediment QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples greater than 1 per 10 primary samples. ▪ Field triplicate (inter-laboratory) samples greater than 1 per 10 primary samples sent to a secondary laboratory.
Laboratory Testing	Sediment samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes).

Table 3-3 Porewater Sampling Methodology

Item	Detail
Porewater Sample Collection	Porewater sampling was undertaken in accordance with the U.S. EPA guidance *Operating Procedure Pore Water Sampling*. Porewater was purged and sampled at less than 1 L per minute using a peristaltic pump, connected to a stainless steel tube with a screened section at its base (Drive-Point Piezometer). The porewater sampler was inserted to at least 1 m below the surficial marine sediments, to ensure collection of pore water rather than surface water. Tubing was replaced at each sampling location to prevent cross-contamination.
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.

Item	Detail
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Porewater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Porewater samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.3 Surface Water Sampling Methodology

The methodology for the surface water monitoring is detailed in Table 3-4.

Table 3-4 Surface water Sampling Methodology

Item	Details
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature Field observations such as odours or sheen presence were also recorded on field sampling sheets.
Sampling Method	Surface water samples were collected directly into sample containers using a 'Grab' (manual) sample method via a long-handled sampling device. The sample container was positioned 10 cm below the surface water level where possible and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films. Samples were collected in accordance with Australian/New Zealand Standards (AS/NZS 5667.1:1998) *Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Surface water QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Surface water samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.4 Quality Control / Quality Assurance

A critical aspect of site assessments is the demonstration of the quality of the data used as the basis for the assessment. This is achieved through a Data Validation process which includes a review of the following data quality indicators, as described in the SAQP:

> QA documentation.

> Bias.

> Data Representativeness.

- Data Precision & Accuracy.
- Laboratory Performance.
- Data Comparability.
- Data Set Completeness.

A detailed review of these aspects has been undertaken, the results of which are presented in Appendix E. The QA/QC review concluded that there are no significant systematic errors in the data collection process and therefore, the dataset used for the assessment is considered valid and complete.

3.5 Assessment Criteria

3.5.1 Groundwater, Porewater and Surface Water

The adopted assessment criteria for groundwater, porewater and surface water are detailed in Table 3-5.

Table 3-5 Criteria for Groundwater, Porewater and Surface Water

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	µg/L		
Human Health - Drinking Water Quality Guideline	0.07[1]	0.56	HEPA 2020
Human Health – Recreational Water	2[1]	10	HEPA 2020
Ecological – 99% species protection	0.00023[2]	19	HEPA 2020

Notes:

1. Sum of PFOS and PFHxS.
2. PFOS only. The criterion of 0.00023 µg/L is lower than the laboratory level of reporting (LOR), however, the PFAS NEMP 2020 allows for the adoption of the laboratory LOR as a screening level rather than a quantified measurement.

3.5.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. Sediment analytical results will be compared to the historical results range for each location.

4 Field Observations and Results

4.1 General Site Observations

Heavy rainfall was recorded at the BoM station 9256 (HSF, Garden Island) with >25mm of rainfall recorded daily for three days (5th -7th June 2023) at the start of the Q2 2023 monitoring event. This has the potential to have impacted groundwater contours and local flow direction with the amount of freshwater infiltration through the sandy grounds at the site.

The daily maximum temperature during the monitoring event varied between 14.8 and 17.9 °C.

4.2 Groundwater

4.2.1 Summary of Field Observations

4.2.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the groundwater sampling event are presented in field sampling records, included in Appendix D. It is noted that field parameters couldn't be recorded at several monitoring wells due to water quality meters issues.

Field parameters were generally consistent with previous monitoring events. Groundwater pH ranged from 7.01 (MW282) to 8.28 (MW233) and was near neutral, water was observed clear to brown in colour. Groundwater temperature ranged from 14.1°C (MW233) to 26.9°C (MW202). DO readings ranged from 0.71 mg/L (MW256) to 5.83 mg/L (MW257) which indicates aerobic groundwater conditions. EC readings ranged from 274 µS/cm (MW233) to 50,393 µS/cm (MW149) and indicate fresh to highly saline groundwater conditions. There was a slight sulphur odour noted at MW123.

4.2.1.2 Groundwater Elevation and Migration

Groundwater gauging data and reduced water levels (RWL) are provided within the field records in Appendix D. The groundwater elevations ranged between 0.132 mAHD (MW496) and 1.166 mAHD (MW195S) which was slightly higher than in Q1 2023. It is expected that groundwater levels and flow direction for monitoring well relatively close to the shoreline are locally and temporally influenced by tidal pressures.

Gauging data was used to infer the groundwater migration contours. Groundwater flow was interpreted to be radial from the site and towards areas of depression following local topography (i.e. groundwater generally flows towards the nearest coastline), which is consistent with previous monitoring events. Groundwater inferred elevation contours and inferred flow direction for the Q2 2023 monitoring event are shown in Figure 6, Appendix A.

4.2.2 Groundwater Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-1. Laboratory results have also been compared to available historical data in order to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figures 2A and 2B in Appendix A presents the groundwater monitoring locations. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	MW112, MW121, MW141, MW172, MW236, MW256, MW282	0.56[2]	6.35 (MW282)	62	7

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
Sum of PFOS and PFHxS	MW109, MW112, MW120, MW121, MW123, MW125, MW128, MW141, MW142, MW147 MW161, MW166, MW171, MW172, MW173, MW193, MW215, MW216, MW220, MW228, MW236, MW239, MW240, MW243, MW249, MW255, MW256, MW257, MW258, MW259, MW268, MW269, MW282, MW288, MW289, MW496, MW500, MW516	0.07[2]	119.0 (MW282)	62	38
PFOS	MW109, MW112, MW120, MW121, MW123, MW128, MW141, MW142, MW147, MW161, MW166, MW171, MW172, MW173, MW193, MW202, MW216, MW217, MW220, MW233, MW236, MW242, MW243, MW245, MW249, MW255, MW256, MW257, MW258, MW259, MW268, MW269, MW282, MW288, MW289, MW496, MW500, MW516	0.01[3]	81.5 (MW282)	62	38

Notes:

1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water.
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the groundwater monitoring locations in Q2 2023.

4.3 Surface Water

4.3.1 Summary of Field Observations

4.3.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the surface water sampling program are presented in field sampling records, included in Appendix D. It is noted that field parameters couldn't be recorded at four monitoring locations (SW305, SW371, SW372, SW373) due to water quality meters issues. Parameters were generally consistent with the previous monitoring events. Surface water pH ranged from 7.92 (SW408) to 8.14 (SW317) and was near neutral, temperature was 17.0°C on average, water was generally clear and EC readings ranging 28,234 (SW134) to 68,610 µS/cm (SW156) indicate highly saline conditions. DO readings ranging 1.23 (SW134) to 6.03 mg/L (SW130) indicate aerobic surface water conditions. No visual or olfactory evidence of contamination were recorded.

4.3.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-2. Laboratory results have also been compared to available historical data. Figures 3A and 3B in Appendix A presents the surface water monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-2 Summary of Surface water Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	27	0
Sum of PFOS and PFHxS	SW372, SW373	0.07[2]	0.30 (SW373)	27	2

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOS	SW305, SW371, SW372, SW373	0.01[3]	0.28 (SW373)	27	4

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the surface water monitoring locations in Q2 2023.

4.4 Porewater

4.4.1 Summary of Field Observations

4.4.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the porewater sampling program are presented in field sampling records, included in Appendix D. It is noted that field parameters couldn't be recorded at three monitoring locations (PW346, PW368, PW304) due to water quality meters issues. Parameters were generally consistent with the previous monitoring events. Porewater pH ranging 7.3 (PW367) to 8.07 (PW351) was near neutral, with an average temperature of 16.7°C. Water was generally clear and EC readings ranging 19,386 (PW409) to 54,879 µS/cm (PW374) indicate saline to highly saline porewater conditions. DO readings ranging 1.64 (PW340) to 6.51 mg/L (PW411) mostly indicate aerobic porewater condition.

4.4.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-3. Laboratory results have also been compared to available historical data. Figures 4A and 4B in Appendix A presents the porewater monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-3 Summary of Porewater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	39	0
Sum of PFOS and PFHxS	PW346, PW368, PW375	0.07[2]	0.65 (PW375)	39	3
PFOS	PW340, PW341, PW345, PW346, PW358, PW363, PW364, PW367, PW368, PW369, PW374, PW375, PW378, PW401	0.01[3]	0.65 (PW375)	39	14

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water.
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations in Q2 2023.

4.5 Sediment

4.5.1 Summary of Field Observations

Observations recorded during the sediment sampling program are provided in the field sampling records within Appendix D. Sediment samples were generally described as beige/cream in colour, fine to medium grained, wet sand.

4.5.2 Laboratory Results

The results of laboratory analysis have been compared to available historical data. Figures 5A and 5B in Appendix A presents the sediment monitoring locations. Tabulated results are presented in Appendix B and the laboratory reports are provided in Appendix C.

Findings are summarised as follows:

> No first-time detection of PFOS or Sum of PFOS and PFHxS was reported for the sediment monitoring locations in Q2 2023.

4.6 Changes to the Monitoring Network Condition

The following changes to the OMP monitoring network were noted during Q2 2023:

> Cardno was informed that GHD had reconditioned monitoring wells MW220 (HSF) and MW112 (FTA). Reconditioning works including clearing of blockages to original wells' depths as detailed below:
  - MW220: A pushtube sample liner was used to dislodge/remove roots from within the well. A submersible pump was then used to develop the well (water was purged until it ran clear, ~15 L).
  - MW112: The drillers alternated between using the submersible pump and disturbing sand within the well (using a pushtube sample liner) until the sand was removed from the well (water ran clear, ~15-20 L).

> The following was noted during the works:
  - No materials were introduced into the wells after final redevelopment with around 15-20 L of groundwater removed or until the water ran clear. Any root matter, sludge, debris was also removed from the wells prior to development using the submersible pump.
  - Clean single-use sample tubes were used at each location.
  - All materials used (sample liners/PVC for wells/End caps etc.) have all been tested and confirmed to be PFAS-free.
  - The pump is moved slightly during development to disturb the fines potentially in the well.

5 Summary and Conclusions

Cardno undertook the Q2 2023 groundwater, porewater, surface water and sediment monitoring event at HMAS Stirling as part of the PFAS OMP. Sampling and testing was undertaken at 62 monitoring wells, 28 surface water locations and 39 co-located sediment and porewater sampling locations.

Groundwater levels were gauged in all wells before sampling, except for MW121 and MW233. Groundwater flow was interpreted to be radial from the site where mounding of groundwater is occurring (i.e. groundwater follows the site's topography and flows towards the ocean), consistent with the previous monitoring events.

The groundwater laboratory results reported the following:

> Of the 62 samples that were tested, PFOA (7 samples), PFOS (38 samples) and Sum of PFHxS and PFOS (38 samples) reported concentrations that exceeded adopted assessment criteria.

> No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the groundwater monitoring locations in Q2 2023.

The surface water laboratory results reported the following:

> Of the 27 samples tested, PFOS (4 samples) and Sum of PFHxS and PFOS (2 sample) were reported above the adopted assessment criteria.

> No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the surface water monitoring locations in Q2 2023.

The porewater laboratory results reported the following:

> Of the 39 samples that were tested, PFOS (14 samples) and Sum of PFOS and PFHxS (3 samples) reported concentrations above adopted assessment criteria.

> No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations in Q2 2023.

The sediment laboratory results reported the following:

> No first-time detection was reported for the sediment monitoring locations in Q2 2023.

The following actions should be undertaken prior to the next OMP sampling event:

> Replacement of the groundwater monitoring wells lost/damaged at the demolition ground (MW137, MW272) and main base area (MW517, MW264, MW518, MW010, MW261).

The next OMP sampling event for HMAS Stirling will be the quarterly monitoring event (Q3 2023), scheduled for September 2023. Ongoing Monitoring Interpretive Reports will be prepared for the October 2021 – September 2022 and October 2022 – September 2023 monitoring periods.

6 References

General References

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Site Specific References

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22. Cardno, March 2021, *PFAS OMP 2020 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling.
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APPENDIX

A

FIGURES

Cardno

now

Stantec

FIGURE 1A

1:32,000 Scale at A3

Metres

0 500 1,000

Site Location

Q2 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-06-19 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001A_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Map

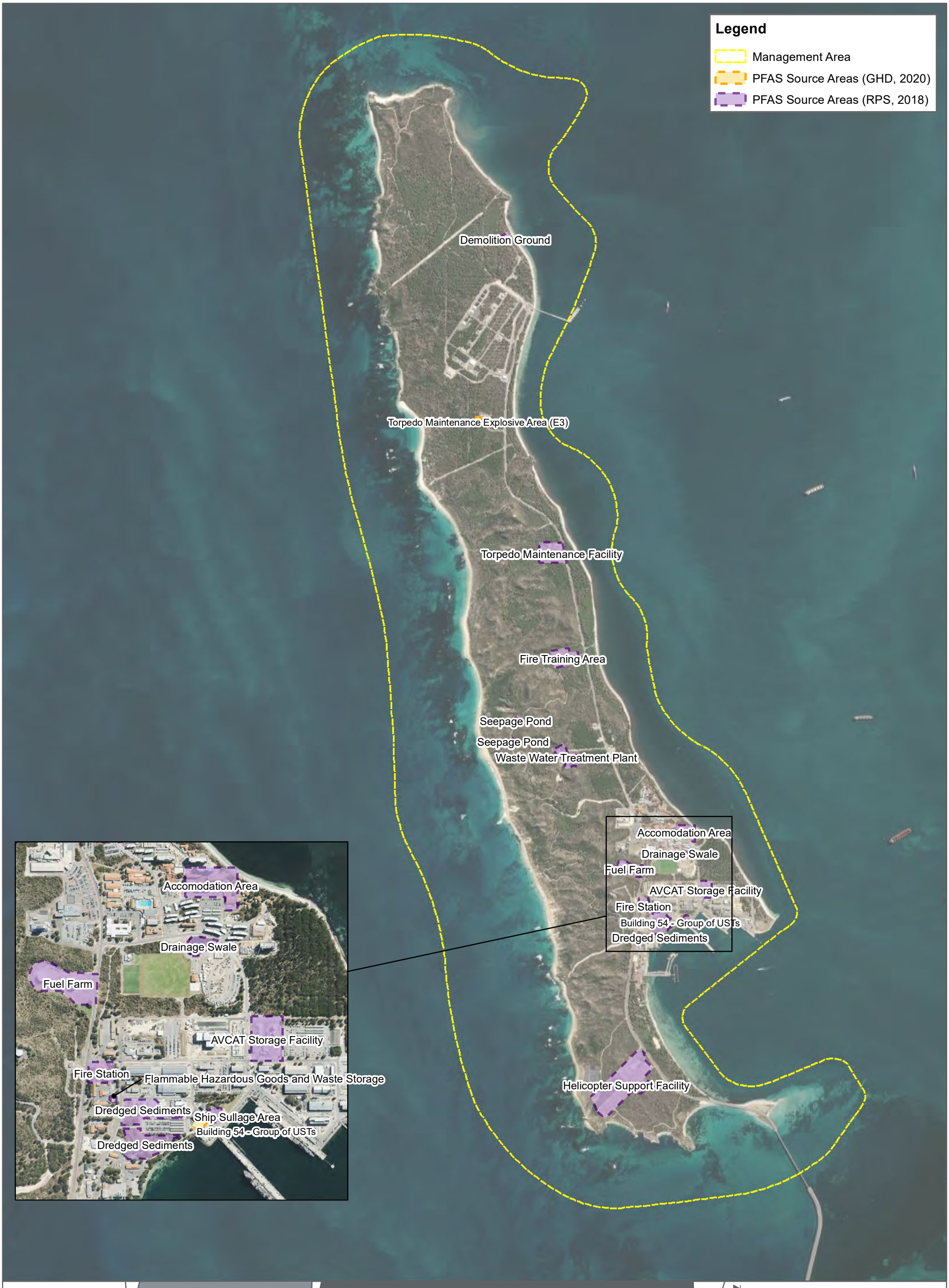


FIGURE 1B

1:32,000 Scale at A3

Metres

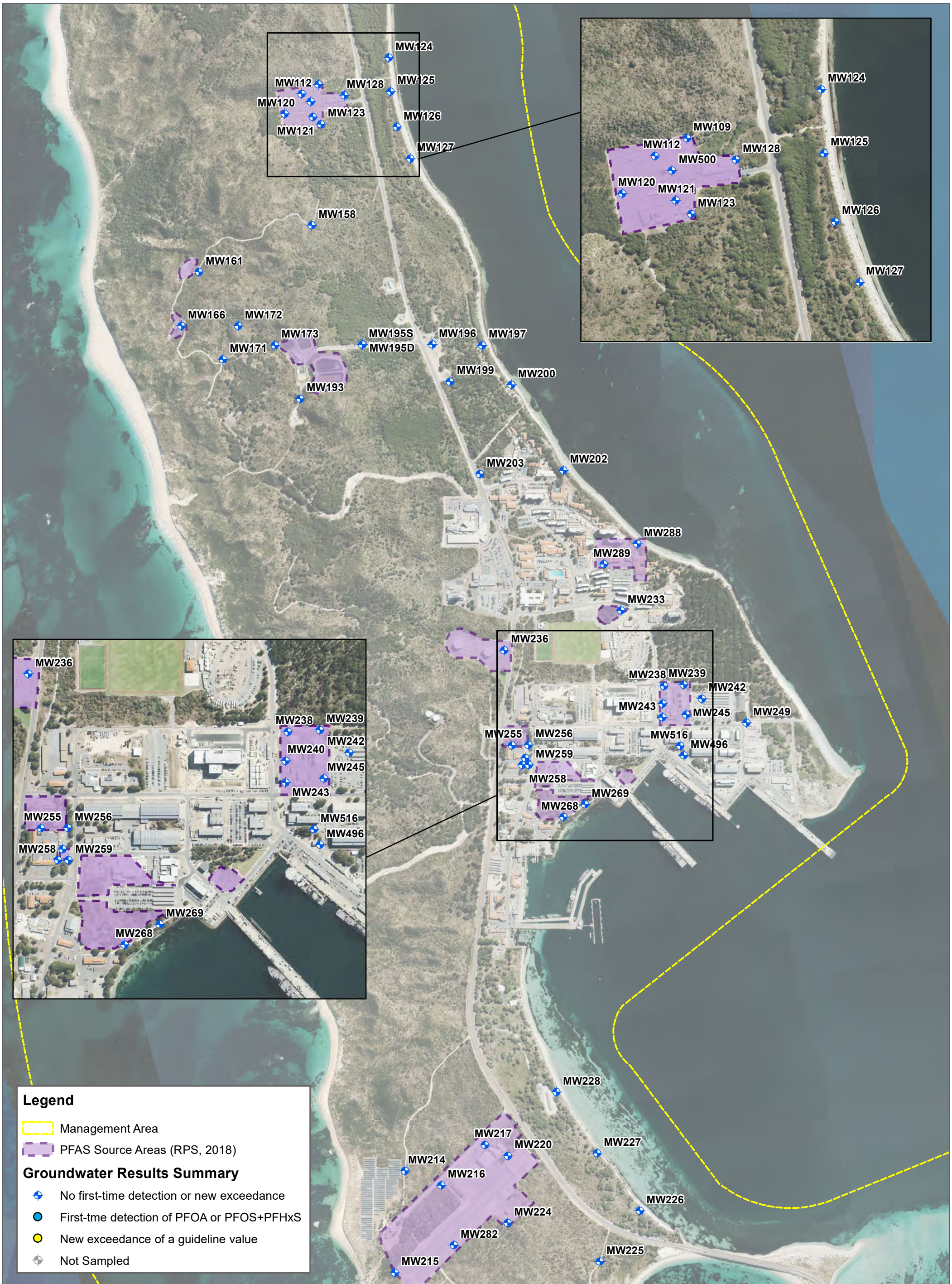
0 500 1,000

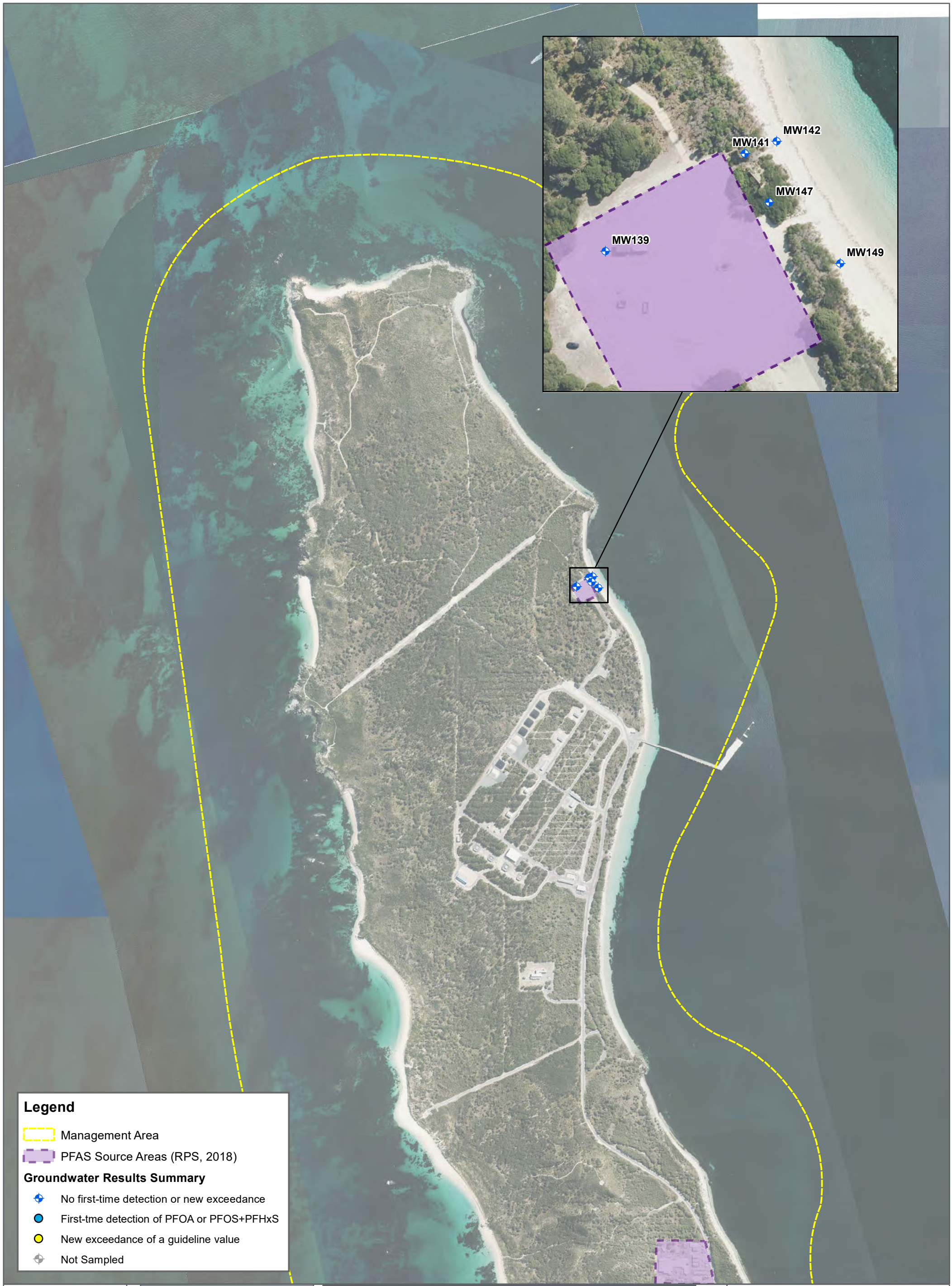
Management Area

Q2 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-06-19 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001B_ManagementArea 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap


MW124
MW112
MW128
MW125
MW120
MW123
MW126
MW121
MW127
MW158
MW161
MW166
MW172
MW173
MW195S
MW196
MW197
MW171
MW195D
MW199
MW200
MW193
MW203
MW202
MW288
MW289
MW233
MW236
MW238
MW239
MW242
MW243
MW245
MW249
MW255
MW256
MW516
MW496
MW259
MW258
MW269
MW268
MW228
MW217
MW220
MW227
MW214
MW216
MW226
MW224
MW282
MW225
MW215
MW109
MW500
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Groundwater Results Summary
No first-time detection or new exceedance
First-tme detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
Not Sampled
FIGURE 2A
1:12,500 Scale at A3
Metres
0
300
600
Groundwater Results
Q2 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-07-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002A_2023Q2_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex


MW142
MW141
MW147
MW139
MW149
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Groundwater Results Summary
No first-time detection or new exceedance
First-tme detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
Not Sampled
FIGURE 2B
1:15,000 Scale at A3
Metres
0
250
500
Groundwater Results
Q2 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-07-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002B_2023Q2_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex

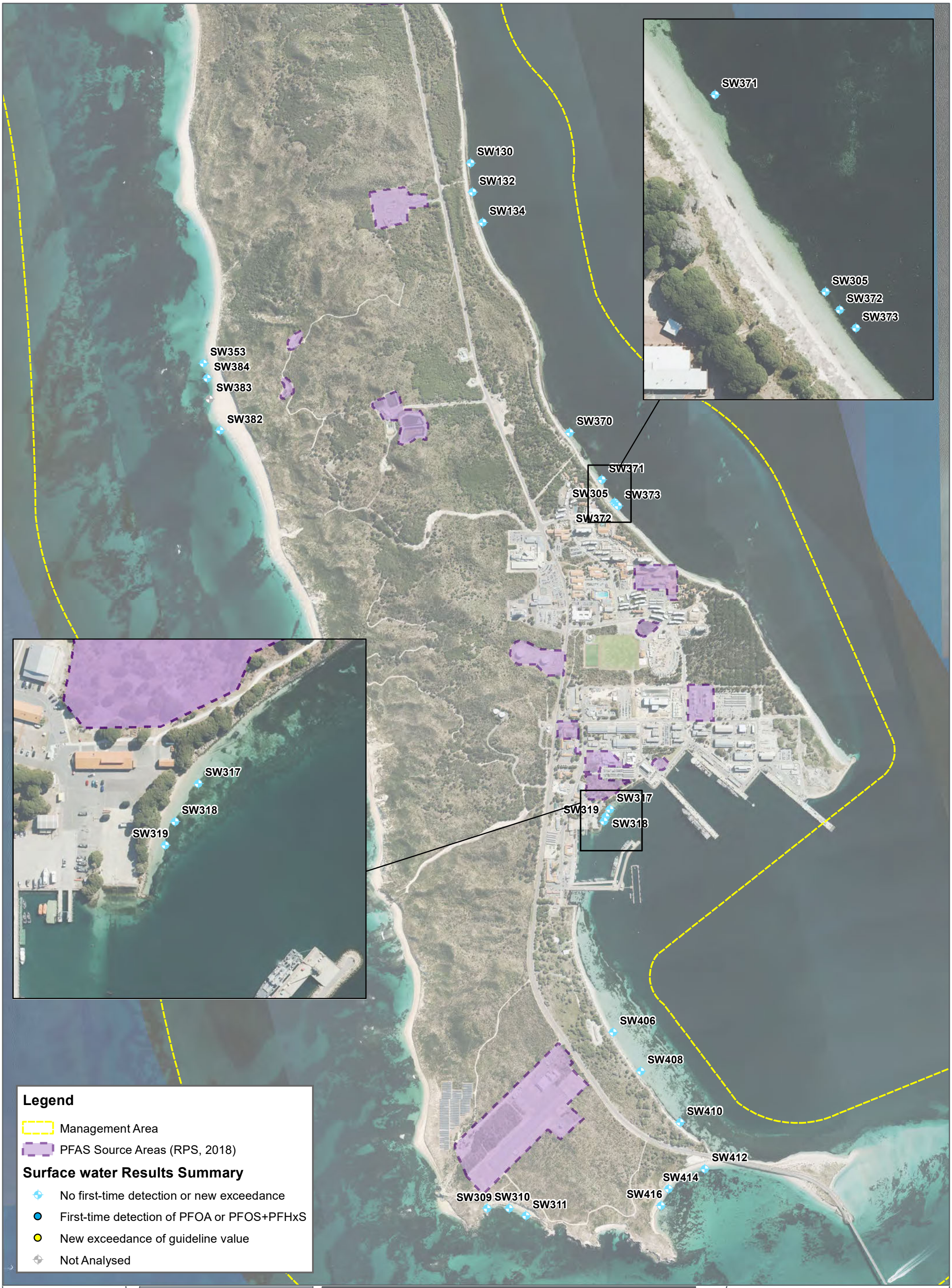


FIGURE 3A

1:15,000 Scale at A3

Metres

0 300 600

Surface water Results

Q2 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-07-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003A_2023Q2_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex

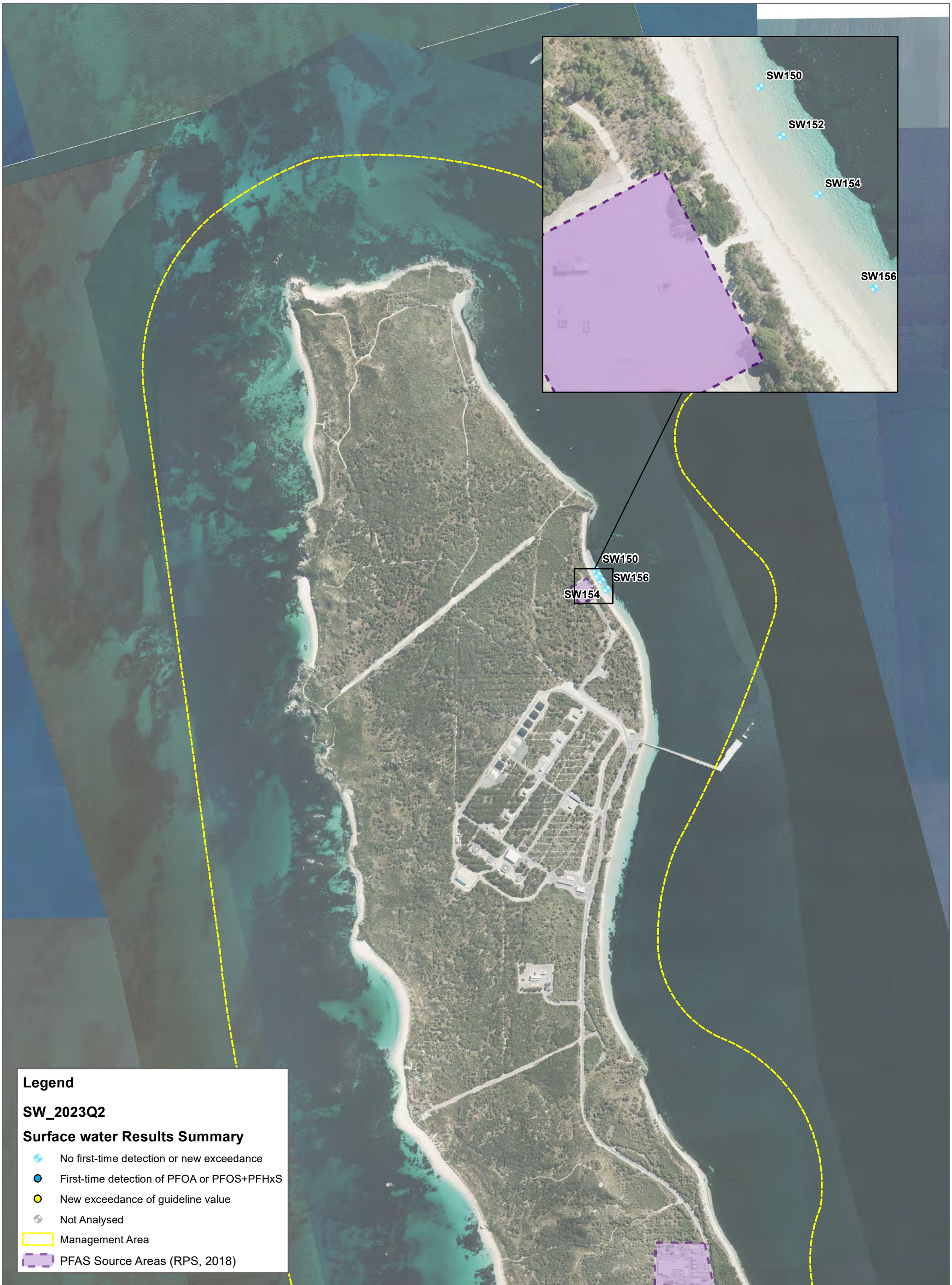


FIGURE 3B

1:15,000 Scale at A3

Metres

0 300 600

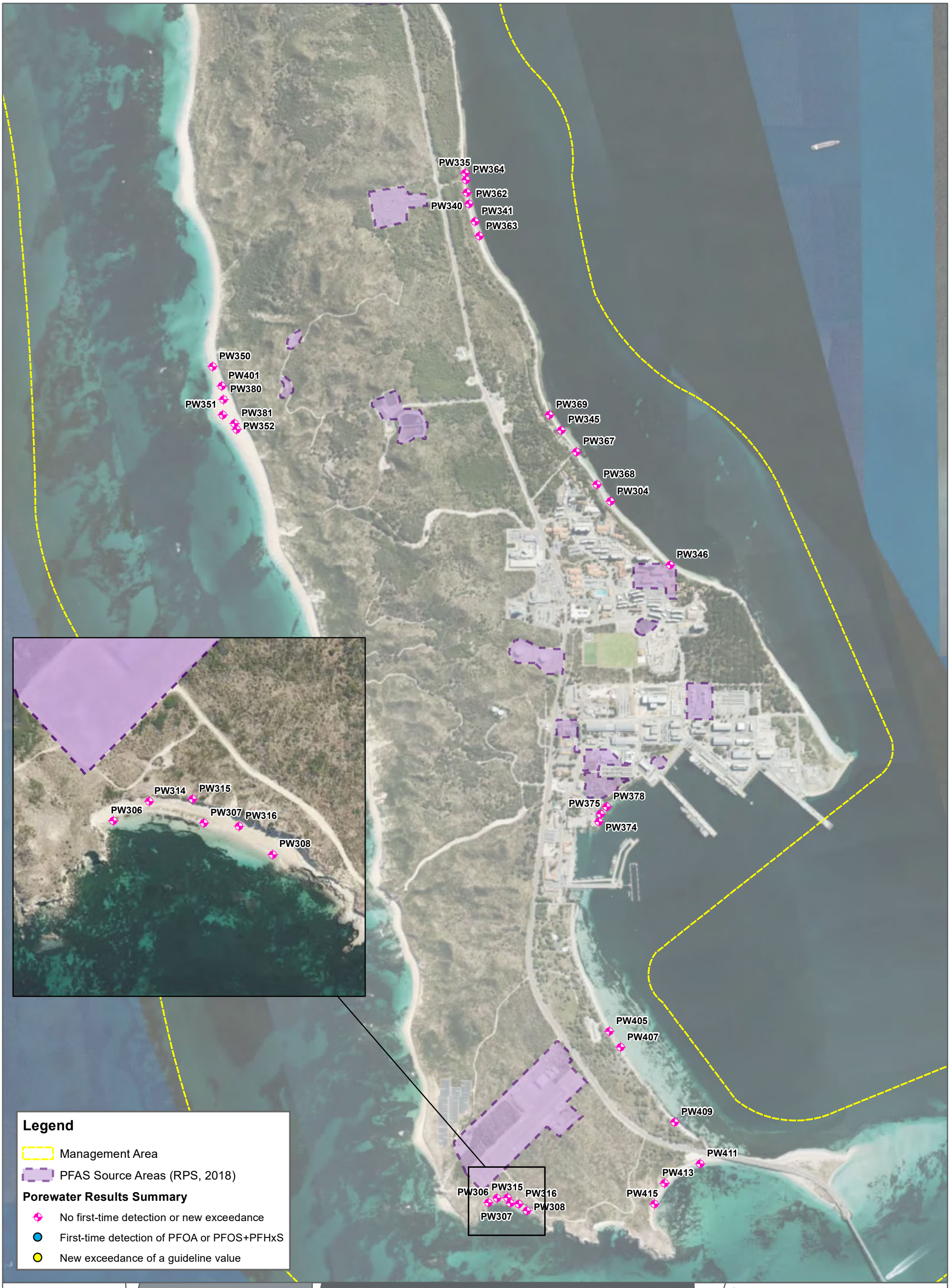
Surface water Results

Q2 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-07-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003B_2023Q2_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap


PW335
PW364
PW362
PW340
PW341
PW363
PW350
PW401
PW380
PW351
PW381
PW352
PW369
PW345
PW367
PW368
PW304
PW346
PW314
PW315
PW306
PW307
PW316
PW308
PW378
PW375
PW374
PW405
PW407
PW409
PW411
PW413
PW415
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Porewater Results Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
FIGURE 4A
1:15,000 Scale at A3
Metres
0
300
600
Porewater Results
Q2 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-07-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004A_2023Q2_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth

PW356
PW331
PW357
PW330
PW358
PW329
PW356
PW358
PW357
PW329

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Porewater Results Summary

- No first-time detection or new exceedance
- First-time detection of PFOA or PFOS+PFHxS
- New exceedance of a guideline value

FIGURE 4B

1:15,000 Scale at A3

Metres

0 300 600

Porewater Results

Q2 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-07-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004B_2023Q2_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

SD335
SD364
SD362
SD340
SD341
SD363
SD350
SD401
SD380
SD381
SD351
SD352
SD369
SD345
SD367
SD368
SD304
SD346
SD314
SD315
SD306
SD307
SD316
SD308
SD375
SD378
SD374
SD405
SD407
SD409
SD411
SD413
SD415

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Sediment Result Summary

- No first-time detection or new exceedance
- First-time detection of PFOA or PFOS+PFHxS
- New exceedance of a guideline value

FIGURE 5A

1:15,000 Scale at A3

Metres

0 300 600

Sediment Results

Q2 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-07-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005A_2023Q2_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth

SD356
SD331
SD357
SD330
SD358
SD329
SD356
SD358
SD357
SD329

Legend

Management Area

PFAS Source Areas (RPS, 2018)

Sediment Result Summary

No first-time detection or new exceedance

First-time detection of PFOA or PFOS+PFHxS

New exceedance of a guideline value

FIGURE 5B

1:15,000 Scale at A3

Metres

0 300 600

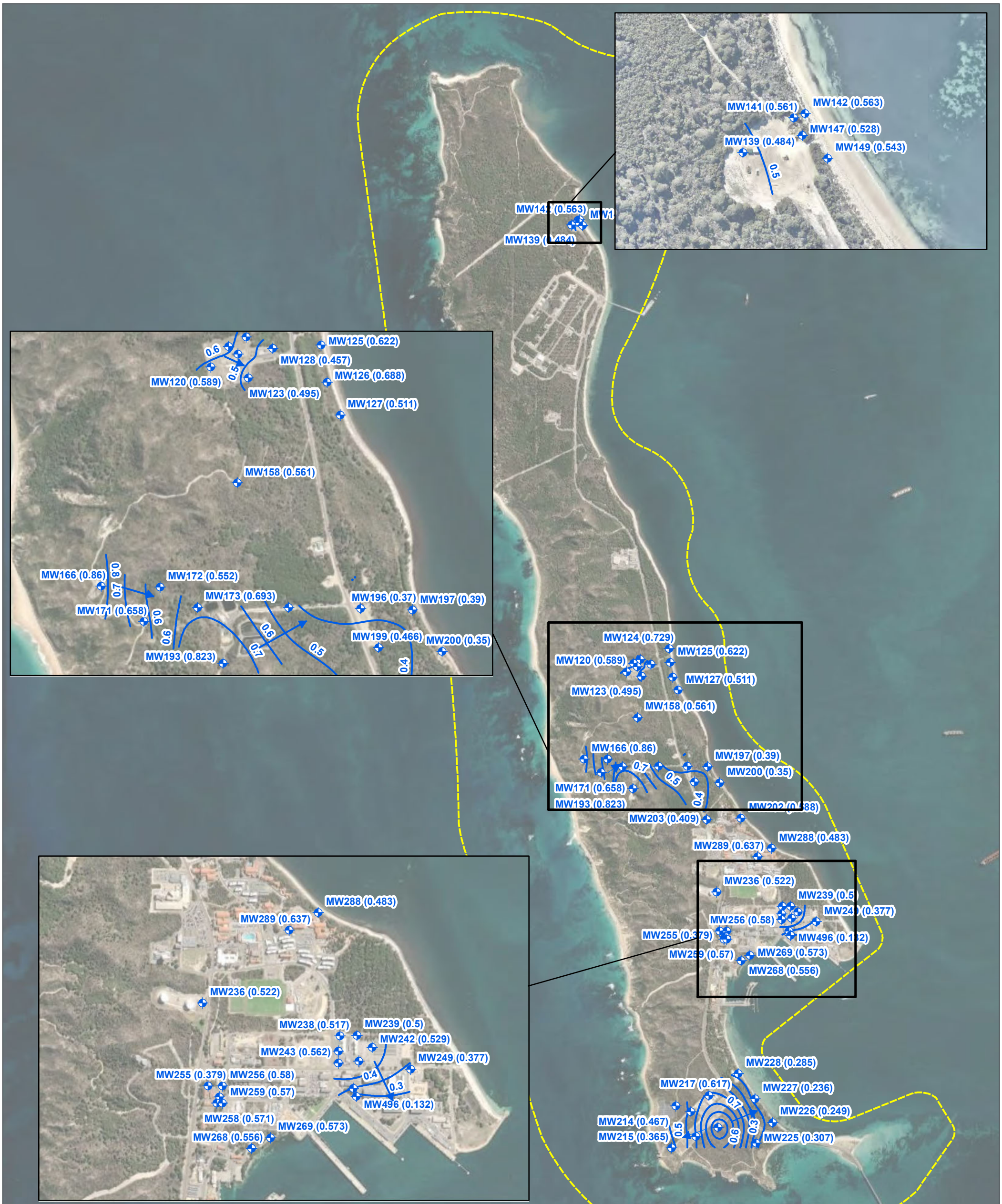
Sediment Results

Q2 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-07-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005B_2023Q2_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap


MW141 (0.561)
MW142 (0.563)
MW147 (0.528)
MW139 (0.484)
MW149 (0.543)
0.5
MW142 (0.563)
MW139 (0.484)
MW125 (0.622)
0.6
MW128 (0.457)
MW126 (0.688)
MW120 (0.589)
0.5
MW123 (0.495)
MW127 (0.511)
MW158 (0.561)
MW166 (0.86)
0.8
0.7
MW172 (0.552)
MW173 (0.693)
MW196 (0.37)
MW197 (0.39)
MW171 (0.658)
0.6
0.6
0.6
0.7
0.5
MW199 (0.466)
MW200 (0.35)
MW193 (0.823)
0.4
MW124 (0.729)
MW125 (0.622)
MW120 (0.589)
MW127 (0.511)
MW123 (0.495)
MW158 (0.561)
MW166 (0.86)
MW197 (0.39)
0.7
0.5
MW200 (0.35)
MW171 (0.658)
0.4
MW193 (0.823)
MW203 (0.409)
MW288 (0.483)
MW289 (0.637)
MW236 (0.522)
MW239 (0.5)
MW256 (0.58)
MW496 (0.132)
MW269 (0.573)
MW268 (0.556)
MW288 (0.483)
MW289 (0.637)
MW236 (0.522)
MW238 (0.517)
MW239 (0.5)
MW242 (0.529)
MW243 (0.562)
MW249 (0.377)
0.4
0.3
MW255 (0.379)
MW256 (0.58)
MW259 (0.57)
MW496 (0.132)
MW258 (0.571)
MW269 (0.573)
MW268 (0.556)
MW228 (0.285)
MW217 (0.617)
MW227 (0.236)
0.7
MW226 (0.249)
MW214 (0.467)
MW215 (0.365)
0.5
0.6
0.3
MW225 (0.307)
Legend
Groundwater wells (RWL, mAHD)
Inferred groundwater contours (mAHD)
Management Area
Note: Gauging was generally conducted during outgoing tides to minimise potential tidal pressure influence
FIGURE 6
1:32,000 Scale at A3
Metres
0
500
1,000
Inferred Groundwater Contours
Q2 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-06-19 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2023Q2_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

APPENDIX

B

DATA ASSESSMENT TABLES

Cardno

now

Stantec

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05
PFAS NEMP 2020 Drinking Water																*0.56*																	
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19																	
PFAS NEMP 2020 Recreational Water																**10**																	
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																												
FTA	**MW109**	**6/06/2023**	**0089_MW109_230606**	**Normal**	**EP2307463**	0.13	0.23	1.73	0.03	0.40	<0.02	0.1	0.02	0.24	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**MW112**	**6/06/2023**	**0089_MW112_230606**	**Normal**	**EP2307463**	0.14	0.55	26.8	6.03	21.6	<0.02	0.1	0.43	2.83	0.56	*4.38*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.29	<0.05	<0.05	0.11	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**MW112**	**6/06/2023**	**0089_QC104_230606**	**Field Duplicate**	**EP2307463**	0.15	0.56	29.5	6.57	20.7	<0.02	0.2	0.46	3.20	0.60	*5.20*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.33	<0.05	<0.05	0.10	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**MW112**	**6/06/2023**	**0089_QC204_230606**	**Interlab Duplicate**	**997465**	0.14	0.82	32	6.7	33	<0.01	0.17	0.46	2.5	0.59	*4.9*	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.30	<0.01	<0.01	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**MW120**	**6/06/2023**	**0089_MW120_230606**	**Normal**	**EP2307463**	0.02	0.05	1.98	0.31	3.09	<0.02	<0.1	0.04	0.16	<0.02	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**MW120**	**6/06/2023**	**0089_QC103_230606**	**Field Duplicate**	**EP2307463**	<0.02	0.05	2.33	0.45	2.29	<0.02	<0.1	0.02	0.13	<0.02	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**MW120**	**6/06/2023**	**0089_QC203_230606**	**Interlab Duplicate**	**997465**	0.02	0.06	2.2	0.25	2.2	<0.01	<0.05	0.03	0.13	0.01	0.22	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**MW121**	**6/06/2023**	**0089_MW121_230606**	**Normal**	**EP2307463**	0.08	0.22	6.47	0.87	5.07	<0.02	0.2	0.32	0.76	0.17	*0.60*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**MW123**	**6/06/2023**	**0089_MW123_230606**	**Normal**	**EP2307463**	0.25	0.19	1.64	<0.02	0.02	<0.02	<0.1	0.04	0.22	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**MW123**	**6/06/2023**	**0089_QC101_230606**	**Field Duplicate**	**EP2307463**	0.34	0.30	2.35	<0.02	0.03	<0.02	<0.1	0.06	0.34	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**MW123**	**6/06/2023**	**0089_QC201_230606**	**Interlab Duplicate**	**997465**	0.24	0.26	1.9	<0.01	0.01	<0.01	<0.05	0.04	0.25	0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**MW124**	**7/06/2023**	**0089_MW124_230607**	**Normal**	**EP2307500**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**MW125**	**7/06/2023**	**0089_MW125_230607**	**Normal**	**EP2307500**	0.23	0.31	0.84	<0.02	<0.01	<0.02	<0.1	0.04	0.24	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**MW126**	**7/06/2023**	**0089_MW126_230607**	**Normal**	**EP2307500**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**MW127**	**7/06/2023**	**0089_MW127_230607**	**Normal**	**EP2307500**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**MW128**	**7/06/2023**	**0089_MW128_230607**	**Normal**	**EP2307555**	0.05	<0.02	0.06	<0.02	1.68	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	**MW139**	**7/06/2023**	**0089_MW139_230607**	**Normal**	**EP2307497**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	**MW139**	**7/06/2023**	**0089_QC110_230607**	**Field Duplicate**	**EP2307497**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	**MW139**	**7/06/2023**	**0089_QC210_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**MW141**	**7/06/2023**	**0089_MW141_230607**	**Normal**	**EP2307497**	0.37	0.86	12.7	1.10	53.0	<0.02	0.2	0.80	7.32	0.26	*1.17*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	**MW142**	**7/06/2023**	**0089_MW142_230607**	**Normal**	**EP2307497**	0.20	0.37	5.12	0.05	0.86	<0.02	0.1	0.42	4.27	0.11	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	**MW147**	**7/06/2023**	**0089_MW147_230607**	**Normal**	**EP2307497**	<0.02	<0.02	0.34	<0.02	0.02	<0.02	<0.1	<0.02	0.09	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	**MW149**	**7/06/2023**	**0089_MW149_230607**	**Normal**	**EP2307497**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW158**	**6/06/2023**	**0089_MW158_230606**	**Normal**	**EP2307463**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW161**	**6/06/2023**	**0089_MW161_230606**	**Normal**	**EP2307463**	<0.02	<0.02	0.08	<0.02	2.38	<0.02	<0.1	0.06	0.05	0.03	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW166**	**6/06/2023**	**0089_MW166_230606**	**Normal**	**EP2307463**	0.05	0.04	0.69	0.11	4.09	<0.02	<0.1	0.25	0.24	0.15	0.07	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW171**	**6/06/2023**	**0089_MW171_230606**	**Normal**	**EP2307463**	1.17	0.67	5.05	0.65	1.07	<0.02	0.6	0.50	1.85	0.15	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW172**	**6/06/2023**	**0089_MW172_230606**	**Normal**	**EP2307463**	1.32	0.94	8.23	1.68	7.52	<0.02	0.5	0.53	2.48	0.21	*0.60*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW173**	**6/06/2023**	**0089_MW173_230606**	**Normal**	**EP2307415**	0.14	0.09	1.93	0.36	3.99	<0.02	<0.1	0.08	0.29	0.04	0.22	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW193**	**6/06/2023**	**0089_MW193_230606**	**Normal**	**EP2307415**	0.31	0.38	4.11	0.31	1.90	<0.02	<0.1	0.14	0.69	0.06	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW195D**	**6/06/2023**	**0089_MW195D_230606**	**Normal**	**EP2307415**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW195S**	**6/06/2023**	**0089_MW195S_230606**	**Normal**	**EP2307415**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW195S**	**6/06/2023**	**0089_QC109_230606**	**Field Duplicate**	**EP2307415**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW195S**	**6/06/2023**	**0089_QC209_230606**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW196**	**6/06/2023**	**0089_MW196_230606**	**Normal**	**EP2307463**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW197**	**7/06/2023**	**0089_MW197_230607**	**Normal**	**EP2307555**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW199**	**6/06/2023**	**0089_MW199_230606**	**Normal**	**EP2307415**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW199**	**6/06/2023**	**0089_QC106_230606**	**Field Duplicate**	**EP2307415**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW199**	**6/06/2023**	**0089_QC206_230606**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW200**	**7/06/2023**	**0089_MW200_230607**	**Normal**	**EP2307555**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW202**	**7/06/2023**	**0089_MW202_230607**	**Normal**	**EP2307497**	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP	**MW203**	**6/06/2023**	**0089_MW203_230606**	**Normal**	**EP2307415**	<0.02	<0.02	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**MW214**	**8/06/2023**	**0089_MW214_230608**	**Normal**	**EP2307588**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**MW215**	**8/06/2023**	**0089_MW215_230608**	**Normal**	**EP2307588**	0.06	0.12	0.63	<0.02	<0.01	<0.02	<0.1	0.06	0.17	0.04	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**MW216**	**8/06/2023**	**0089_MW216_230608**	**Normal**	**EP2307588**	0.24	0.32	2.65	0.08	0.47	<0.02	3.8	8.91	8.65	0.50	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.92	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**MW217**	**8/06/2023**	**0089_MW217_230608**	**Normal**	**EP2307588**	<0.02	<0.02	0.02	<0.02	0.02	<0.02	1.7	7.97	5.63	0.87	0.37	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	19.2	0.30	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**MW220**	**8/06/2023**	**0089_MW220_230608**	**Normal**	**EP2307586**	0.05	0.05	0.82	0.10	7.27	<0.02	0.1	0.17	0.24	0.10	0.14	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**MW224**	**8/06/2023**	**0089_MW224_230608**	**Normal**	**EP2307586**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**MW225**	**8/06/2023**	**0089_MW225_230608**	**Normal**	**EP2307588**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**MW226**	**8/06/2023**	**0089_MW226_230608**	**Normal**	**EP2307587**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**MW227**	**8/06/2023**	**0089_MW227_230608**	**Normal**	**EP2307587**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**MW228**	**8/06/2023**	**0089_MW228_230608**	**Normal**	**EP2307587**	0.14	0.12	0.16	<0.02	<0.01	<0.02	1.0	3.20	2.95	0.84	0.14	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.47	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW233**	**6/06/2023**	**0089_MW233_230606**	**Normal**	**EP2307415**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW236**	**6/06/2023**	**0089_MW236_230606**	**Normal**	**EP2307433**	0.16	0.21	17.0	0.63	52.3	<0.02	<0.1	0.12	0.60	0.27	*1.99*	2.91	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW238**	**7/06/2023**	**0089_MW238_230607**	**Normal**	**EP2307500**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW239**	**7/06/2023**	**0089_MW239_230607**	**Normal**	**EP2307500**	<0.02	<0.02	0.15	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW240**	**7/06/2023**	**0089_MW240_230607**	**Normal**	**EP2307500**	<0.02	0.03	0.57	<0.02	<0.01	<0.02	<0.1	<0.02	0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW242**	**6/06/2023**	**0089_MW242_230606**	**Normal**	**EP2307463**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW243**	**7/06/2023**	**0089_MW243_230607**	**Normal**	**EP2307500**	<0.02	<0.02	0.06	<0.02	0.12	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW245**	**7/06/2023**	**0089_MW245_230607**	**Normal**	**EP2307500**	<0.02	<0.02	0.03	<0.02	0.02	<0.02	<0.3	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW249**	**6/06/2023**	**0089_MW249_230606**	**Normal**	**EP2307433**	<0.02	<0.02	0.21	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Fire Station, Flammable/Hazardous Goods and Waste Storage, Ship Sullage	**MW255**	**6/06/2023**	**0089_MW255_230606**	**Normal**	**EP2307433**	0.40	0.47	7.58	<0.02	0.32	<0.02	0.1	0.18	0.95	0.14	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	MW256	**6/06/2023**	**0089_MW256_230606**	**Normal**	**EP2307433**	0.77	0.76	8.00	0.35	11.2	<0.02	0.3	0.45	1.73	0.19	*0.67*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.13	<0.05	<0.05	0.08	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	MW257	**6/06/2023**	**0089_MW257_230606**	**Normal**	**EP2307433**	<0.02	<0.02	0.38	<0.02	0.10	<0.02	<0.1	0.11	0.06	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	MW258	**6/06/2023**	**0089_MW258_230606**	**Normal**	**EP2307433**	2.35	2.04	5.09	0.29	6.73	<0.02	1.2	2.61	2.98	0.49	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.31	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	MW259	**6/06/2023**	**0089_MW259_230606**	**Normal**	**EP2307433**	<0.02	<0.02	0.10	<0.02	0.14	<0.02	<0.1

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Table 1 - Groundwater, Surface water and Porewater Analytical Results

PFAS OMP
HMAS Stirling
Q2 2023

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05
PFAS NEMP 2020 Drinking Water											*0.56*																	
PFAS NEMP 2020 Interim Marine 99%					0.00023*						19																	
PFAS NEMP 2020 Recreational Water											**10**																	
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																							
FTA	**PW364**	**7/06/2023**	**0089_QC118_230607**	**Field Duplicate**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**PW364**	**7/06/2023**	**0089_QC218_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW367**	**7/06/2023**	**0089_PW367_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (East)	**PW367**	**7/06/2023**	**0089_QC111_230607**	**Field Duplicate**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (East)	**PW367**	**7/06/2023**	**0089_QC211_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.11	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW368**	**7/06/2023**	**0089_PW368_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	0.15	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (East)	**PW369**	**7/06/2023**	**0089_PW369_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Dredge Spoil / Careening Bay	**PW374**	**6/06/2023**	**0089_PW374_230606**	**Normal**	**EP2307434**	<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Dredge Spoil / Careening Bay	**PW374**	**6/06/2023**	**0089_QC108_230606**	**Field Duplicate**	**EP2307463**	<0.02	<0.02	<0.01	<0.02	0.12	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Dredge Spoil / Careening Bay	**PW374**	**6/06/2023**	**0089_QC208_230606**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW375**	**6/06/2023**	**0089_PW375_230606**	**Normal**	**EP2307434**	<0.02	<0.02	<0.01	<0.02	0.65	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Dredge Spoil / Careening Bay	**PW378**	**6/06/2023**	**0089_PW378_230606**	**Normal**	**EP2307434**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (West)	**PW380**	**7/06/2023**	**0089_PW380_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (West)	**PW381**	**7/06/2023**	**0089_PW381_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (West)	**PW401**	**7/06/2023**	**0089_PW401_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**PW405**	**8/06/2023**	**0089_PW405_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	0.04	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**PW407**	**8/06/2023**	**0089_PW407_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	0.04	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**PW409**	**8/06/2023**	**0089_PW409_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**PW411**	**8/06/2023**	**0089_PW411_230608**	**Normal**	**EP2307593**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**PW413**	**8/06/2023**	**0089_PW413_230608**	**Normal**	**EP2307593**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**PW415**	**8/06/2023**	**0089_PW415_230608**	**Normal**	**EP2307593**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**SW130**	**7/06/2023**	**0089_SW130_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**SW132**	**7/06/2023**	**0089_SW132_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
FTA	**SW134**	**7/06/2023**	**0089_SW134_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	**SW150**	**7/06/2023**	**0089_QC115_230607**	**Field Duplicate**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	**SW150**	**7/06/2023**	**0089_QC215_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**SW150**	**7/06/2023**	**0089_SW150_230607**	**Normal**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	**SW152**	**7/06/2023**	**0089_SW152_230607**	**Normal**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	**SW154**	**7/06/2023**	**0089_SW154_230607**	**Normal**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	**SW156**	**7/06/2023**	**0089_SW156_230607**	**Normal**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (East)	**SW305**	**7/06/2023**	**0089_SW305_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**SW309**	**8/06/2023**	**0089_SW309_230608**	**Normal**	**EP2307590**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**SW310**	**8/06/2023**	**0089_SW310_230608**	**Normal**	**EP2307590**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**SW311**	**8/06/2023**	**0089_SW311_230608**	**Normal**	**EP2307590**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Dredge Spoil / Careening Bay	**SW317**	**6/06/2023**	**0089_SW317_230606**	**Normal**	**EP2307434**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Dredge Spoil / Careening Bay	**SW318**	**6/06/2023**	**0089_SW318_230606**	**Normal**	**EP2307434**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Dredge Spoil / Careening Bay	**SW319**	**6/06/2023**	**0089_QC105_230606**	**Field Duplicate**	**EP2307434**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Dredge Spoil / Careening Bay	**SW319**	**6/06/2023**	**0089_QC205_230606**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**SW319**	**6/06/2023**	**0089_SW319_230606**	**Normal**	**EP2307434**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (West)	**SW353**	**7/06/2023**	**0089_SW353_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (East)	**SW370**	**7/06/2023**	**0089_QC112_230607**	**Field Duplicate**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (East)	**SW370**	**7/06/2023**	**0089_QC212_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**SW370**	**7/06/2023**	**0089_SW370_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (East)	**SW371**	**7/06/2023**	**0089_SW371_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (East)	**SW372**	**7/06/2023**	**0089_SW372_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (West)	**SW373**	**7/06/2023**	**0089_SW373_230607**	**Normal**	**EP2307502**	<0.02	<0.02	0.02	<0.02	0.28	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (West)	**SW382**	**7/06/2023**	**0089_SW382_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
WWTP (West)	**SW384**	**7/06/2023**	**0089_SW384_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**SW406**	**8/06/2023**	**0089_SW406_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	0.04	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**SW408**	**8/06/2023**	**0089_SW408_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	0.04	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**SW410**	**8/06/2023**	**0089_SW410_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**SW412**	**8/06/2023**	**0089_SW412_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**SW414**	**8/06/2023**	**0089_SW414_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
HSF	**SW416**	**8/06/2023**	**0089_SW416_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
		6/06/2023	**0089_QC301_230606**	**Rinsate**	**EP2307463**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
		6/06/2023	**0089_QC302_230606**	**Rinsate**	**EP2307463**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
		6/06/2023	**0089_QC303_230606**	**Rinsate**	**EP2307463**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
		6/06/2023	**0089_QC401_230606**	**Field Blank**	**EP2307463**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
		6/06/2023	**0089_QC402_230606**	**Field Blank**	**EP2307463**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
		6/06/2023	**0089_QC403_230606**	**Field Blank**	**EP2307463**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
		7/06/2023	**0089_QC301_230607**	**Rinsate**	**EP2307555**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
		7/06/2023	**0089_QC302_230607**	**Rinsate**	**EP2307555**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
		7/06/2023	**0089_QC303_230607**	**Rinsate**	**EP2307555**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
		7/06/2023	**0089_QC401_230607**	**Field Blank**	**EP2307555**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
		7/06/2023	**0089_QC402_230607**	**Field Blank**	**EP2307555**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
		7/06/2023	**0089_QC403_230607**	**Field Blank**	**EP2307555**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

						PFAS			Inorganics							Metals			
						Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.01	0.01	0.01	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water						*0.07*													
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water						**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
FTA	**MW109**	**6/06/2023**	**0089_MW109_230606**	**Normal**	**EP2307463**	***2.13***	2.66	2.92	<1	411	12.5	11.2	136	5.29	22	104	25	<1	92
FTA	**MW112**	**6/06/2023**	**0089_MW112_230606**	**Normal**	**EP2307463**	***48.4***	57.1	63.8	<1	248	6.88	6.15	41	5.58	37	81	11	3	26
FTA	**MW112**	**6/06/2023**	**0089_QC104_230606**	**Field Duplicate**	**EP2307463**	***50.2***	60.3	67.6											
FTA	**MW112**	**6/06/2023**	**0089_QC204_230606**	**Interlab Duplicate**	**997465**	***65***	74.06	81.77											
FTA	**MW120**	**6/06/2023**	**0089_MW120_230606**	**Normal**	**EP2307463**	***5.07***	5.46	5.82	<1	247	6.42	6.09	41	2.66	16	68	16	3	30
FTA	**MW120**	**6/06/2023**	**0089_QC103_230606**	**Field Duplicate**	**EP2307463**	***4.62***	5.01	5.51											
FTA	**MW120**	**6/06/2023**	**0089_QC203_230606**	**Interlab Duplicate**	**997465**	***4.4***	4.81	5.12											
FTA	**MW121**	**6/06/2023**	**0089_MW121_230606**	**Normal**	**EP2307463**	***11.5***	13.7	14.8	<1	274	7.67	8.08	55	2.60	31	101	17	3	36
FTA	**MW123**	**6/06/2023**	**0089_MW123_230606**	**Normal**	**EP2307463**	*1.66*	2.17	2.36	<1	554	17.0	15.4	200	5.22	16	116	32	4	157
FTA	**MW123**	**6/06/2023**	**0089_QC101_230606**	**Field Duplicate**	**EP2307463**	***2.38***	3.15	3.45	<1	792	28.7	27.7	457	1.79	<1	119	77	3	353
FTA	**MW123**	**6/06/2023**	**0089_QC201_230606**	**Interlab Duplicate**	**997465**	*1.91*	2.48	2.81											
FTA	**MW124**	**7/06/2023**	**0089_MW124_230607**	**Normal**	**EP2307500**	<0.01	<0.01	<0.01	<1	338	392	464	12,400	8.51	1,680	378	858	285	8,450
FTA	**MW125**	**7/06/2023**	**0089_MW125_230607**	**Normal**	**EP2307500**	*0.84*	1.35	1.66	<1	354	458	531	14,500	7.36	2,030	434	993	332	9,640
FTA	**MW126**	**7/06/2023**	**0089_MW126_230607**	**Normal**	**EP2307500**	<0.01	<0.01	<0.01	<1	559	383	422	12,100	4.75	1,480	366	815	253	7,580
FTA	**MW127**	**7/06/2023**	**0089_MW127_230607**	**Normal**	**EP2307500**	<0.01	<0.01	<0.01	<1	522	414	459	13,100	5.16	1,630	368	914	272	8,240
FTA	**MW128**	**7/06/2023**	**0089_MW128_230607**	**Normal**	**EP2307555**	*1.74*	1.79	1.79	<1	271	9.38	8.95	120	2.37	28	96	28	1	42
Demolition Ground	**MW139**	**7/06/2023**	**0089_MW139_230607**	**Normal**	**EP2307497**	<0.01	<0.01	<0.01	<1	196	19.1	17.8	500	3.78	54	80	33	10	248
Demolition Ground	**MW139**	**7/06/2023**	**0089_QC110_230607**	**Field Duplicate**	**EP2307497**	<0.01	<0.01	<0.01	<1	205	25.6	24.7	712	1.75	68	95	46	14	364
Demolition Ground	**MW139**	**7/06/2023**	**0089_QC210_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.05	<0.1											
Demolition Ground	**MW141**	**7/06/2023**	**0089_MW141_230607**	**Normal**	**EP2307497**	***65.7***	75.8	77.8	<1	410	308	340	9,700	4.97	1,250	459	684	216	5,870
Demolition Ground	**MW142**	**7/06/2023**	**0089_MW142_230607**	**Normal**	**EP2307497**	***5.98***	11.3	11.7	<1	329	326	359	10,300	4.81	1,400	379	746	244	6,270
Demolition Ground	**MW147**	**7/06/2023**	**0089_MW147_230607**	**Normal**	**EP2307497**	*0.36*	0.46	0.46	<1	573	213	222	6,610	2.14	706	372	450	124	3,750
Demolition Ground	**MW149**	**7/06/2023**	**0089_MW149_230607**	**Normal**	**EP2307497**	<0.01	<0.01	<0.01	<1	217	481	533	15,200	5.16	2,300	464	1,100	337	9,450
WWTP	**MW158**	**6/06/2023**	**0089_MW158_230606**	**Normal**	**EP2307463**	<0.01	<0.01	<0.01	<1	455	150	160	4,600	3.17	530	202	347	108	2,720
WWTP	**MW161**	**6/06/2023**	**0089_MW161_230606**	**Normal**	**EP2307463**	***2.46***	2.61	2.61	<1	376	32.6	35.0	726	3.54	224	81	53	35	592
WWTP	**MW166**	**6/06/2023**	**0089_MW166_230606**	**Normal**	**EP2307463**	***4.78***	5.54	5.71	<1	370	34.6	38.3	848	5.06	158	100	84	35	586
WWTP	**MW171**	**6/06/2023**	**0089_MW171_230606**	**Normal**	**EP2307463**	***6.12***	10.7	12.0	<1	512	72.6	80.7	1,980	5.26	315	110	188	57	1,340
WWTP	**MW172**	**6/06/2023**	**0089_MW172_230606**	**Normal**	**EP2307463**	***15.8***	21.4	24.0	<1	442	47.8	54.8	1,200	6.82	247	96	123	47	890
WWTP	**MW173**	**6/06/2023**	**0089_MW173_230606**	**Normal**	**EP2307415**	***5.92***	6.69	7.14	<1	420	33.5	37.6	821	5.76	96	134	90	23	528
WWTP	**MW193**	**6/06/2023**	**0089_MW193_230606**	**Normal**	**EP2307415**	***6.01***	7.51	8.20	<1	746	32.2	27.8	534	7.38	108	93	80	15	372
WWTP	**MW195D**	**6/06/2023**	**0089_MW195D_230606**	**Normal**	**EP2307415**	0.01	0.01	0.01	<1	166	367	417	11,600	6.37	1,760	389	819	262	7,440
WWTP	**MW195S**	**6/06/2023**	**0089_MW195S_230606**	**Normal**	**EP2307415**	<0.01	<0.01	<0.01	<1	587	42.9	45.3	900	2.74	279	164	113	35	620
WWTP	**MW195S**	**6/06/2023**	**0089_QC109_230606**	**Field Duplicate**	**EP2307415**	<0.01	<0.01	<0.01	<1	588	43.1	45.3	904	2.51	280	164	114	35	617
WWTP	**MW195S**	**6/06/2023**	**0089_QC209_230606**	**Interlab Duplicate**	**997465**	<0.01	<0.05	<0.1											
WWTP	**MW196**	**6/06/2023**	**0089_MW196_230606**	**Normal**	**EP2307463**	<0.01	<0.01	<0.01	<1	214	5.69	4.99	36	6.51	19	55	14	2	24
WWTP	**MW197**	**7/06/2023**	**0089_MW197_230607**	**Normal**	**EP2307555**	<0.01	<0.01	<0.01	<1	537	84.9	98.2	2,440	7.26	258	116	124	69	1,850
WWTP	**MW199**	**6/06/2023**	**0089_MW199_230606**	**Normal**	**EP2307415**	<0.01	<0.01	<0.01	<1	364	18.1	18.3	340	0.72	58	89	42	10	234
WWTP	**MW199**	**6/06/2023**	**0089_QC106_230606**	**Field Duplicate**	**EP2307415**	<0.01	<0.01	<0.01	<1	371	19.2	19.4	372	0.59	60	87	43	11	258
WWTP	**MW199**	**6/06/2023**	**0089_QC206_230606**	**Interlab Duplicate**	**997465**	<0.01	<0.05	<0.1											
WWTP	**MW200**	**7/06/2023**	**0089_MW200_230607**	**Normal**	**EP2307555**	<0.01	<0.01	<0.01	<1	524	88.0	98.8	2,560	5.73	258	114	126	70	1,860
WWTP	**MW202**	**7/06/2023**	**0089_MW202_230607**	**Normal**	**EP2307497**	0.03	0.03	0.03	<1	356	14.0	14.1	212	0.31	45	116	23	5	145
WWTP	**MW203**	**6/06/2023**	**0089_MW203_230606**	**Normal**	**EP2307415**	0.04	0.04	0.04	<1	282	8.91	9.20	60	1.58	76	70	41	6	50
HSF	**MW214**	**8/06/2023**	**0089_MW214_230608**	**Normal**	**EP2307588**	<0.01	<0.01	<0.01	<1	453	44.7	44.9	1,250	0.18	19	223	82	6	617
HSF	**MW215**	**8/06/2023**	**0089_MW215_230608**	**Normal**	**EP2307588**	*0.63*	0.97	1.09	<1	279	25.9	25.4	611	1.10	149	161	42	13	311
HSF	**MW216**	**8/06/2023**	**0089_MW216_230608**	**Normal**	**EP2307588**	***3.12***	27.4	27.8	<1	288	34.0	34.6	825	0.92	240	196	59	9	455
HSF	**MW217**	**8/06/2023**	**0089_MW217_230608**	**Normal**	**EP2307586**	0.04	36.1	36.1	<1	306	7.72	7.26	31	3.04	35	102	11	7	25
HSF	**MW220**	**8/06/2023**	**0089_MW220_230608**	**Normal**	**EP2307586**	***8.09***	8.89	9.04	<1	263	7.94	8.02	79	0.50	22	102	16	7	33
HSF	**MW224**	**8/06/2023**	**0089_MW224_230608**	**Normal**	**EP2307586**	<0.01	<0.01	<0.01	<1	316	10.1	8.89	106	6.23	37	62	19	4	95
HSF	**MW225**	**8/06/2023**	**0089_MW225_230608**	**Normal**	**EP2307588**	<0.01	<0.01	<0.01	<1	324	21.0	20.4	482	1.34	43	141	41	5	227
HSF	**MW226**	**8/06/2023**	**0089_MW226_230608**	**Normal**	**EP2307587**	<0.01	<0.01	<0.01	<1	601	441	485	13,800	4.74	1,920	480	1,050	350	8,410
HSF	**MW227**	**8/06/2023**	**0089_MW227_230608**	**Normal**	**EP2307587**	<0.01	<0.01	<0.01	<1	360	35.6	38.9	852	4.44	208	114	79	31	595
HSF	**MW228**	**8/06/2023**	**0089_MW228_230608**	**Normal**	**EP2307587**	*0.16*	8.90	9.02	<1	581	185	212	5,500	6.69	878	232	491	151	3,580
AVCAT Storage and Fuel Farm	**MW233**	**6/06/2023**	**0089_MW233_230606**	**Normal**	**EP2307415**	0.04	0.04	0.04	<1	93	2.50	2.22	20	6.13	4	25	3	1	16
AVCAT Storage and Fuel Farm	**MW236**	**6/06/2023**	**0089_MW236_230606**	**Normal**	**EP2307433**	***69.3***	72.4	76.2	<1	324	7.67	6.53	29	8.02	18	87	16	<1	20
AVCAT Storage and Fuel Farm	**MW238**	**7/06/2023**	**0089_MW238_230607**	**Normal**	**EP2307500**	0.01	0.01	0.01	<1	219	7.03	6.80	41	1.66	72	89	14	3	26
AVCAT Storage and Fuel Farm	**MW239**	**7/06/2023**	**0089_MW239_230607**	**Normal**	**EP2307500**	*0.15*	0.15	0.15	<1	223	6.74	6.84	36	0.71	61	98	13	2	19
AVCAT Storage and Fuel Farm	**MW240**	**7/06/2023**	**0089_MW240_230607**	**Normal**	**EP2307500**	*0.57*	0.60	0.63	<1	260	8.24	7.94	46	1.87	84	113	12	2	29
AVCAT Storage and Fuel Farm	**MW242**	**6/06/2023**	**0089_MW242_230606**	**Normal**	**EP2307463**	0.01	0.01	0.01	<1	184	4.47	4.06	14	4.76	19	54	11	1	10
AVCAT Storage and Fuel Farm	**MW243**	**7/06/2023**	**0089_MW243_230607**	**Normal**	**EP2307500**	*0.18*	0.18	0.18	<1	282	9.04	9.22	81	0.99	54	122	17	5	37
AVCAT Storage and Fuel Farm	**MW245**	**7/06/2023**	**0089_MW245_230607**	**Normal**	**EP2307500**	0.05	0.05	0.05	<1	481	10.5	10.6	28	0.81	4	160	18	4	25
AVCAT Storage and Fuel Farm	**MW249**	**6/06/2023**	**0089_MW249_230606**	**Normal**	**EP2307433**	*0.24*	0.24	0.24	<1	439	14.4	13.1	155	4.75	59	94	38	8	116
Fire Station, Flammable/Hazardous Goods and Waste Storage, Ship Sullage	**MW255**	**6/06/2023**	**0089_MW255_230606**	**Normal**	**EP2307433**	***7.90***	9.71	10.2	<1	260	7.68	7.32	61	2.41	37	83	11	4	50
	MW256	**6/06/2023**	**0089_MW256_230606**	**Normal**	**EP2307433**	***19.2***	23.4	24.6	<1	525	17.6	16.3	239	3.98	19	110	55	5	141
	MW257	**6/06/2023**	**0089_MW257_230606**	**Normal**	**EP2307433**	*0.48*	0.67	0.67	<1	244	5.44	3.83	14	17.4	8	52	8	2	12
	MW258	**6/06/2023**	**0089_MW258_230606**	**Normal**	**EP2307433**	***11.8***	22.1	24.4	<1	130	12.0	17.6	279	19.0	73	150	50	18	128
	MW259	**6/06/2023**	**0089_MW259_230606**	**Normal**	**EP2307433**	*0.24*	0.49	0.49	<1	268	6.18	5.08	22	9.75	10	68	12	2	15
	MW259	**6/06/2023**	**0089_QC102_230606**	**Field Duplicate**	**EP2307433**	*0.27*	0.51	0.51											
	MW259	**6/06/2023**	**0089_QC202_230606**	**Interlab Duplicate**	**997465**	*0.17*	0.39	0.4											
Dredge Spoil / Careening Bay	**MW268**	**6/06/2023**	**0089_MW268_230606**	**Normal**	**EP2307433**	*0.30*	0.41	0.48	<1	426	119	135	3,260	6.50	886	232	320	89	2,190
Dredge Spoil / Careening Bay	**MW269**	**6/06/2023**	**0089_MW269_230606**	**Normal**	**EP2307433**	*0.65*	0.81	0.88	<1	393	17.5	16.7	258	2.22	114	68	53	13	199
HSF	**MW282**	**8/06/2023**	**0089_MW282_230608**	**Normal**	**EP2307586**	***119***	136	144	<1	474	11.2	11.5	53	1.40	12	178	19	<1	25
Accomodation Area	**MW288**	**7/06/2023**	**0089_MW288_230607**	**Normal**	**EP2307500**	*1.23*	1.23	1.23	<1	309	8.82	8.19	71	3.72	31	105	16	6	34
Accomodation Area	**MW289**	**6/06/2023**	**0089_MW289_230606**	**Normal**	**EP2307415**	*1.96*	2.05	2.12	<1	489	13.1	9.98	88	13.4	39	85	25	6	81
AVCAT Storage and Fuel Farm	**MW496**	**6/06/2023**	**0089_MW496_230606**	**Normal**	**EP2307433**	***9.22***	9.62	9.83	<1	571	19.5	15.7	253	10.7	44	70	39	15	198
FTA	**MW500**	**6/06/2023**	**0089_MW500_230606**	**Normal**	**EP2307463**	***38.1***	40.4	42.2	<1	450	11.2	9.84	52	6.60	37	149	14	3	27
AVCAT Storage and Fuel Farm	**MW516**	**6/06/2023**	**0089_MW516_230606**	**Normal**	**EP2307433**	***9.29***	9.47	9.61	<1	482	12.0	11.0	73	4.37	16	92	37	8	73
WWTP (East)	**PW304**	**7/06/2023**	**0089_PW304_230607**	**Normal**	**EP2307502**	<0.01	<0.01	<0.01	<1	181	492	505	15,700	1.25	2,200	429	1,050	315	8,940
HSF	**PW306**	**8/06/2023**	**0089_PW306_230608**	**Normal**	**EP2307590**	<0.01	<0.01	<0.01	<1	135	566	602	18,200	3.15	2,380	487	1,250	385	10,700
HSF	**PW307**	**8/06/2023**	**0089_PW307_230608**	**Normal**	**EP2307590**	<0.01	<0.01	<0.01	<1	134	568	586	18,400	1.57	2,220	471	1,220	383	10,400
HSF	**PW308**	**8/06/2023**	**0089_PW308_230608**	**Normal**	**EP2307590**	<0.01	<0.01	<0.01	<1	135	567	597	18,300	2.56	2,310	478	1,240	383	10,600
HSF	**PW314**	**8/06/2023**	**0089_PW314_230608**	**Normal**	**EP2307590**	<0.01	<0.01	<0.01	<1	133	567	632	18,200	5.36	2,460	491	1,330	406	11,200
HSF	**PW315**	**8/06/2023**	**0089_PW315_230608**	**Normal**	**EP2307590**	<0.01	<0.01	<0.01	<1	147	570	628	18,400	4.84	2,310	527	1,320	405	11,100
HSF	**PW316**	**8/06/2023**	**0089_PW316_230608**	**Normal**	**EP2307590**	<0.01	<0.01	<0.01	<1	131	582	588	18,500	0.45	2,790	472	1,240	384	10,400
Demolition Ground	**PW329**	**7/06/2023**	**0089_PW329_230607**	**Normal**	**EP2307498**	<0.01	<0.01	<0.01	<1	269	543	598	17,400	4.86	2,240	502	1,240	394	10,600
Demolition Ground	**PW330**	**7/06/2023**	**0089_PW330_230607**	**Normal**	**EP2307498**	<0.01	<0.01	<0.01	<1	168	550	593	17,400	3.76	2,670	513	1,220	389	10,500
Demolition Ground	**PW331**	**7/06/2023**	**0089_PW331_230607**	**Normal**	**EP2307498**	<0.01	<0.01	<0.01	<1	268	535	598	17,000	5.55	2,410	496	1,240	394	10,600
FTA	**PW335**	**7/06/2023**	**0089_PW335_230607**	**Normal**	**EP2307502**	<0.01	<0.01	<0.01	<1	168	561	571	17,900	0.89	2,520	439	1,170	350	10,200
FTA	**PW340**	**7/06/2023**	**0089_PW340_230607**	**Normal**	**EP2307502**	0.03	0.03	0.03	<1	152	530	539	16,900	0.81	2,430	443	1,110	330	9,590
FTA	**PW341**	**7/06/2023**	**0089_PW341_230607**	**Normal**	**EP2307502**	0.02	0.02	0.02	<1	167	478	490	15,200	1.30	2,200	375	1,000	315	8,770
WWTP (East)	**PW345**	**7/06/2023**	**0089_PW345_230607**	**Normal**	**EP2307493**	0.02	0.02	0.02	<1	161	522	616	16,700	8.26	2,300	384	1,100	418	11,400
Accomodation Area	**PW346**	**7/06/2023**	**0089_PW346_230607**	**Normal**	**EP2307502**	*0.59*	0.59	0.59	<1	327	544	558	17,300	1.31	2,360	522	1,150	333	9,860
WWTP (West)	**PW350**	**7/06/2023**	**0089_PW350_230607**	**Normal**	**EP2307493**	<0.01	<0.01	<0.01	<1	117	616	674	19,700	4.53	2,780	427	1,240	456	12,400
WWTP (West)	**PW351**	**7/06/2023**	**0089_PW351_230607**	**Normal**	**EP2307493**	<0.01	<0.01	<0.01	<1	117	619	685	19,800	5.10	2,780	435	1,260	462	12,600
WWTP (West)	**PW352**	**7/06/2023**	**0089_PW352_230607**	**Normal**	**EP2307493**	<0.01	<0.01	<0.01	<1	116	621	669	19,900	3.69	2,770	422	1,230	454	12,300
Demolition Ground	**PW356**	**7/06/2023**	**0089_PW356_230607**	**Normal**	**EP2307498**	<0.01	<0.01	<0.01	<1	259	546	603	17,200	4.98	2,670	507	1,250	375	10,700
Demolition Ground	**PW356**	**7/06/2023**	**0089_QC116_230607**	**Field Duplicate**	**EP2307498**	<0.01	<0.01	<0.01	<1	266	542	604	17,200	5.40	2,460	502	1,250	402	10,700
Demolition Ground	**PW356**	**7/06/2023**	**0089_QC216_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.05	<0.1											
Demolition Ground	**PW357**	**7/06/2023**	**0089_PW357_230607**	**Normal**	**EP2307498**	<0.01	<0.01	<0.01	<1	169	543	600	17,200	5.00	2,620	487	1,220	396	10,700
Demolition Ground	**PW358**	**7/06/2023**	**0089_PW358_230607**	**Normal**	**EP2307498**	0.01	0.01	0.01	<1	167	543	618	17,400	6.46	2,360	522	1,260	397	11,000
FTA	**PW362**	**7/06/2023**	**0089_PW362_230607**	**Normal**	**EP2307502**	<0.01	<0.01	<0.01	<1	152	544	568	17,400	2.21	2,400	466	1,180	340	10,100
FTA	**PW363**	**7/06/2023**	**0089_PW363_230607**	**Normal**	**EP2307502**	0.01	0.01	0.01	<1	126	606	629	19,400	1.84	2,700	496	1,300	384	11,200
FTA	**PW364**	**7/06/2023**	**0089_PW364_230607**	**Normal**	**EP2307502**	0.02	0.02	0.02	<1	144	596	591	19,100	0.45	2,630	490	1,220	372	10,500

						PFAS			Inorganics							Metals			
						Sum of PFHxS and PFOS	Sum of PFAS (WA DER list)	Sum of PFAS	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.01	0.01	0.01	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water						*0.07*													
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water						**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
FTA	**PW364**	**7/06/2023**	**0089_QC118_230607**	**Field Duplicate**	**EP2307502**	0.02	0.02	0.02											
FTA	**PW364**	**7/06/2023**	**0089_QC218_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.05	<0.1											
WWTP (East)	**PW367**	**7/06/2023**	**0089_PW367_230607**	**Normal**	**EP2307493**	0.04	0.04	0.04	<1	408	454	489	14,400	3.69	1,900	332	875	338	9,000
WWTP (East)	**PW367**	**7/06/2023**	**0089_QC111_230607**	**Field Duplicate**	**EP2307493**	0.02	0.02	0.02											
WWTP (East)	**PW367**	**7/06/2023**	**0089_QC211_230607**	**Interlab Duplicate**	**997465**	0.02	0.13	0.13											
WWTP (East)	**PW368**	**7/06/2023**	**0089_PW368_230607**	**Normal**	**EP2307502**	*0.15*	0.15	0.15	<1	198	557	564	17,800	0.62	2,460	467	1,180	344	10,000
WWTP (East)	**PW369**	**7/06/2023**	**0089_PW369_230607**	**Normal**	**EP2307493**	0.02	0.02	0.02	<1	162	551	617	17,600	5.67	2,460	388	1,110	415	11,400
Dredge Spoil / Careening Bay	**PW374**	**6/06/2023**	**0089_PW374_230606**	**Normal**	**EP2307434**	0.07	0.07	0.07	<1	125	643	718	20,600	5.53	2,860	434	1,340	484	13,200
Dredge Spoil / Careening Bay	**PW374**	**6/06/2023**	**0089_QC108_230606**	**Field Duplicate**	**EP2307463**	*0.12*	0.12	0.12											
Dredge Spoil / Careening Bay	**PW374**	**6/06/2023**	**0089_QC208_230606**	**Interlab Duplicate**	**997465**	0.05	0.05	<0.1											
Dredge Spoil / Careening Bay	**PW375**	**6/06/2023**	**0089_PW375_230606**	**Normal**	**EP2307434**	*0.65*	0.65	0.65	<1	123	643	717	20,600	5.45	2,870	430	1,330	485	13,200
Dredge Spoil / Careening Bay	**PW378**	**6/06/2023**	**0089_PW378_230606**	**Normal**	**EP2307434**	0.02	0.02	0.02	<1	122	605	749	19,300	10.6	2,800	484	1,560	544	13,400
WWTP (West)	**PW380**	**7/06/2023**	**0089_PW380_230607**	**Normal**	**EP2307493**	<0.01	<0.01	<0.01	<1	118	628	665	20,100	2.90	2,800	419	1,240	453	12,200
WWTP (West)	**PW381**	**7/06/2023**	**0089_PW381_230607**	**Normal**	**EP2307493**	<0.01	<0.01	<0.01	<1	116	616	669	19,700	4.13	2,770	421	1,230	450	12,300
WWTP (West)	**PW401**	**7/06/2023**	**0089_PW401_230607**	**Normal**	**EP2307493**	0.01	0.01	0.01	<1	116	620	661	19,900	3.17	2,720	418	1,190	450	12,200
HSF	**PW405**	**8/06/2023**	**0089_PW405_230608**	**Normal**	**EP2307592**	<0.01	0.08	0.08	<1	130	592	612	18,900	1.67	2,720	465	1,230	377	11,000
HSF	**PW407**	**8/06/2023**	**0089_PW407_230608**	**Normal**	**EP2307592**	<0.01	0.08	0.08	<1	130	590	597	18,800	0.58	2,750	470	1,200	368	10,700
HSF	**PW409**	**8/06/2023**	**0089_PW409_230608**	**Normal**	**EP2307592**	<0.01	<0.01	<0.01	<1	151	498	503	15,900	0.46	2,250	383	1,020	315	9,010
HSF	**PW411**	**8/06/2023**	**0089_PW411_230608**	**Normal**	**EP2307593**	<0.01	<0.01	<0.01	<1	236	602	707	19,200	8.03	2,690	418	1,330	457	13,000
HSF	**PW413**	**8/06/2023**	**0089_PW413_230608**	**Normal**	**EP2307593**	<0.01	<0.01	<0.01	<1	150	594	590	18,900	0.32	2,780	473	1,220	369	10,500
HSF	**PW415**	**8/06/2023**	**0089_PW415_230608**	**Normal**	**EP2307593**	<0.01	<0.01	<0.01	<1	120	602	702	19,300	7.66	2,670	420	1,320	453	12,900
FTA	**SW130**	**7/06/2023**	**0089_SW130_230607**	**Normal**	**EP2307502**	<0.01	<0.01	<0.01	<1	125	609	615	19,500	0.46	2,710	461	1,260	370	11,000
FTA	**SW132**	**7/06/2023**	**0089_SW132_230607**	**Normal**	**EP2307502**	<0.01	<0.01	<0.01	<1	125	613	615	19,600	0.18	2,780	476	1,260	373	11,000
FTA	**SW134**	**7/06/2023**	**0089_SW134_230607**	**Normal**	**EP2307502**	<0.01	<0.01	<0.01	<1	124	610	622	19,500	1.04	2,740	476	1,290	379	11,100
Demolition Ground	**SW150**	**7/06/2023**	**0089_QC115_230607**	**Field Duplicate**	**EP2307498**	<0.01	<0.01	<0.01	<1	119	555	601	17,600	4.02	2,690	485	1,240	378	10,700
Demolition Ground	**SW150**	**7/06/2023**	**0089_QC215_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.05	<0.1											
Demolition Ground	**SW150**	**7/06/2023**	**0089_SW150_230607**	**Normal**	**EP2307498**	<0.01	<0.01	<0.01	<1	136	546	606	17,400	5.19	2,530	486	1,240	388	10,800
Demolition Ground	**SW152**	**7/06/2023**	**0089_SW152_230607**	**Normal**	**EP2307498**	<0.01	<0.01	<0.01	<1	120	545	605	17,400	5.25	2,490	477	1,240	384	10,800
Demolition Ground	**SW154**	**7/06/2023**	**0089_SW154_230607**	**Normal**	**EP2307498**	<0.01	<0.01	<0.01	<1	120	536	611	17,200	6.52	2,350	485	1,250	395	10,900
Demolition Ground	**SW156**	**7/06/2023**	**0089_SW156_230607**	**Normal**	**EP2307498**	<0.01	<0.01	<0.01	<1	120	540	599	17,200	5.13	2,540	464	1,220	388	10,700
WWTP (East)	**SW305**	**7/06/2023**	**0089_SW305_230607**	**Normal**	**EP2307502**	0.03	0.03	0.03	<1	143	596	635	19,100	3.16	2,610	517	1,310	382	11,300
HSF	**SW309**	**8/06/2023**	**0089_SW309_230608**	**Normal**	**EP2307590**	<0.01	<0.01	<0.01	<1	118	587	609	18,900	1.84	2,470	475	1,280	398	10,800
HSF	**SW310**	**8/06/2023**	**0089_SW310_230608**	**Normal**	**EP2307590**	<0.01	<0.01	<0.01	<1	118	584	632	18,800	3.95	2,480	495	1,340	401	11,200
HSF	**SW311**	**8/06/2023**	**0089_SW311_230608**	**Normal**	**EP2307590**	<0.01	<0.01	<0.01	<1	119	578	580	18,700	0.23	2,300	449	1,220	377	10,300
Dredge Spoil / Careening Bay	**SW317**	**6/06/2023**	**0089_SW317_230606**	**Normal**	**EP2307434**	<0.01	<0.01	<0.01	<1	118	640	714	20,500	5.43	2,860	426	1,340	482	13,100
Dredge Spoil / Careening Bay	**SW318**	**6/06/2023**	**0089_SW318_230606**	**Normal**	**EP2307434**	<0.01	<0.01	<0.01	<1	127	640	735	20,700	6.84	2,600	444	1,370	493	13,500
Dredge Spoil / Careening Bay	**SW319**	**6/06/2023**	**0089_QC105_230606**	**Field Duplicate**	**EP2307434**	<0.01	<0.01	<0.01											
Dredge Spoil / Careening Bay	**SW319**	**6/06/2023**	**0089_QC205_230606**	**Interlab Duplicate**	**997465**	<0.01	<0.05	<0.1											
Dredge Spoil / Careening Bay	**SW319**	**6/06/2023**	**0089_SW319_230606**	**Normal**	**EP2307434**	<0.01	<0.01	<0.01	<1	122	638	708	20,400	5.21	2,890	424	1,330	475	13,000
WWTP (West)	**SW353**	**7/06/2023**	**0089_SW353_230607**	**Normal**	**EP2307493**	<0.01	<0.01	<0.01	<1	118	613	659	19,600	3.62	2,780	415	1,170	452	12,200
WWTP (East)	**SW370**	**7/06/2023**	**0089_QC112_230607**	**Field Duplicate**	**EP2307493**	<0.01	<0.01	<0.01											
WWTP (East)	**SW370**	**7/06/2023**	**0089_QC212_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.05	<0.1											
WWTP (East)	**SW370**	**7/06/2023**	**0089_SW370_230607**	**Normal**	**EP2307493**	<0.01	<0.01	<0.01	<1	125	616	706	19,800	6.79	2,660	437	1,300	468	13,000
WWTP (East)	**SW371**	**7/06/2023**	**0089_SW371_230607**	**Normal**	**EP2307502**	0.06	0.06	0.06	<1	131	594	575	19,000	1.66	2,670	464	1,200	360	10,200
WWTP (East)	**SW372**	**7/06/2023**	**0089_SW372_230607**	**Normal**	**EP2307502**	*0.08*	0.08	0.08	<1	138	588	602	18,800	1.16	2,650	473	1,260	367	10,700
WWTP (West)	**SW373**	**7/06/2023**	**0089_SW373_230607**	**Normal**	**EP2307502**	*0.30*	0.30	0.30	<1	157	603	616	19,300	1.00	2,680	480	1,260	368	11,000
WWTP (West)	**SW382**	**7/06/2023**	**0089_SW382_230607**	**Normal**	**EP2307493**	<0.01	<0.01	<0.01	<1	117	618	674	19,800	4.39	2,730	429	1,240	456	12,400
WWTP (West)	**SW384**	**7/06/2023**	**0089_SW384_230607**	**Normal**	**EP2307493**	<0.01	<0.01	<0.01	<1	118	624	672	20,000	3.70	2,770	418	1,220	450	12,400
HSF	**SW406**	**8/06/2023**	**0089_SW406_230608**	**Normal**	**EP2307592**	<0.01	0.08	0.08	<1	130	545	597	17,400	4.50	2,490	446	1,210	367	10,700
HSF	**SW408**	**8/06/2023**	**0089_SW408_230608**	**Normal**	**EP2307592**	<0.01	0.08	0.08	<1	130	543	606	17,300	5.42	2,540	455	1,210	365	10,900
HSF	**SW410**	**8/06/2023**	**0089_SW410_230608**	**Normal**	**EP2307592**	<0.01	<0.01	<0.01	<1	124	551	596	17,600	3.95	2,510	461	1,200	366	10,700
HSF	**SW412**	**8/06/2023**	**0089_SW412_230608**	**Normal**	**EP2307592**	<0.01	<0.01	<0.01	<1	119	601	608	19,200	0.55	2,740	472	1,220	374	10,900
HSF	**SW414**	**8/06/2023**	**0089_SW414_230608**	**Normal**	**EP2307592**	<0.01	<0.01	<0.01	<1	122	603	592	19,300	0.88	2,690	462	1,200	369	10,600
HSF	**SW416**	**8/06/2023**	**0089_SW416_230608**	**Normal**	**EP2307592**	<0.01	<0.01	<0.01	<1	120	548	601	17,500	4.56	2,510	455	1,200	371	10,800
		6/06/2023	**0089_QC301_230606**	**Rinsate**	**EP2307463**	<0.01	<0.01	<0.01											
		6/06/2023	**0089_QC302_230606**	**Rinsate**	**EP2307463**	<0.01	<0.01	<0.01											
		6/06/2023	**0089_QC303_230606**	**Rinsate**	**EP2307463**	<0.01	<0.01	<0.01											
		6/06/2023	**0089_QC401_230606**	**Field Blank**	**EP2307463**	<0.01	<0.01	<0.01											
		6/06/2023	**0089_QC402_230606**	**Field Blank**	**EP2307463**	<0.01	<0.01	<0.01											
		6/06/2023	**0089_QC403_230606**	**Field Blank**	**EP2307463**	<0.01	<0.01	<0.01											
		7/06/2023	**0089_QC301_230607**	**Rinsate**	**EP2307555**	<0.01	<0.01	<0.01											
		7/06/2023	**0089_QC302_230607**	**Rinsate**	**EP2307555**	<0.01	<0.01	<0.01											
		7/06/2023	**0089_QC303_230607**	**Rinsate**	**EP2307555**	<0.01	<0.01	<0.01											
		7/06/2023	**0089_QC401_230607**	**Field Blank**	**EP2307555**	<0.01	<0.01	<0.01											
		7/06/2023	**0089_QC402_230607**	**Field Blank**	**EP2307555**	<0.01	<0.01	<0.01											
		7/06/2023	**0089_QC403_230607**	**Field Blank**	**EP2307555**	<0.01	<0.01	<0.01											
		8/06/2023	**0089_QC301_230608**	**Rinsate**	**EP2307587**	<0.01	<0.01	<0.01											
		8/06/2023	**0089_QC302_230608**	**Rinsate**	**EP2307587**	<0.01	<0.01	<0.01											
		8/06/2023	**0089_QC303_230608**	**Rinsate**	**EP2307587**	<0.01	<0.01	<0.01											
		8/06/2023	**0089_QC401_230608**	**Field Blank**	**EP2307587**	<0.01	<0.01	<0.01											
		8/06/2023	**0089_QC402_230608**	**Field Blank**	**EP2307587**	<0.01	<0.01	<0.01											
		8/06/2023	**0089_QC403_230608**	**Field Blank**	**EP2307587**	<0.01	<0.01	<0.01											

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water
Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.
Notes:
First-time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

Cardno now Stantec

Table 2 - Sediment Analytical Results

PFAS OMP
HMAS Stirling
Q2 2023

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carb					
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**												
WWTP	SD304	7/06/2023	0089_SD304_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD306	8/06/2023	0089_SD306_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD307	8/06/2023	0089_SD307_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD308	8/06/2023	0089_SD308_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD314	8/06/2023	0089_SD314_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD315	8/06/2023	0089_SD315_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD316	8/06/2023	0089_SD316_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition ground	SD329	7/06/2023	0089_SD329_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition ground	SD330	7/06/2023	0089_SD330_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition ground	SD331	7/06/2023	0089_SD331_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	SD335	7/06/2023	0089_SD335_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	SD340	7/06/2023	0089_SD340_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	SD341	7/06/2023	0089_SD341_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	SD345	7/06/2023	0089_SD345_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Accomodation Area	SD346	7/06/2023	0089_SD346_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	0.0009	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	SD350	7/06/2023	0089_SD350_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	SD351	7/06/2023	0089_SD351_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	SD352	7/06/2023	0089_SD352_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition ground	SD356	7/06/2023	0089_QC114_230607	Field Duplicate	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition ground	SD356	7/06/2023	0089_QC214_230607	Interlab Duplicate	997465	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Demolition ground	SD356	7/06/2023	0089_SD356_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition ground	SD357	7/06/2023	0089_SD357_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition ground	SD358	7/06/2023	0089_SD358_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	SD362	7/06/2023	0089_SD362_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	SD363	7/06/2023	0089_SD363_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	SD364	7/06/2023	0089_QC117_230607	Field Duplicate	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	SD364	7/06/2023	0089_QC217_230607	Interlab Duplicate	997465	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	SD364	7/06/2023	0089_SD364_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	SD367	7/06/2023	0089_SD367_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	SD368	7/06/2023	0089_SD368_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	SD369	7/06/2023	0089_QC113_230607	Field Duplicate	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	SD369	7/06/2023	0089_QC213_230607	Interlab Duplicate	997465	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WWTP	SD369	7/06/2023	0089_SD369_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Dredge spoil and careening bay	SD374	6/06/2023	0089_QC107_230606	Field Duplicate	EP2307435	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	6/06/2023	0089_QC207_230606	Interlab Duplicate	997465	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD374	6/06/2023	0089_SD374_230606	Normal	EP2307435	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD375	6/06/2023	0089_SD375_230606	Normal	EP2307435	<0.0002	<0.0002	<0.0002	<0.0002	0.0030	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	6/06/2023	0089_SD378_230606	Normal	EP2307435	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	SD380	7/06/2023	0089_SD380_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	SD381	7/06/2023	0089_SD381_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	SD401	7/06/2023	0089_SD401_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD405	8/06/2023	0089_SD405_230608	Normal	EP2307591	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD407	8/06/2023	0089_SD407_230608	Normal	EP2307591	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD409	8/06/2023	0089_SD409_230608	Normal	EP2307591	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD411	8/06/2023	0089_SD411_230608	Normal	EP2307594	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD413	8/06/2023	0089_SD413_230608	Normal	EP2307594	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD415	8/06/2023	0089_SD415_230608	Normal	EP2307594	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:

First-time detection of PFOA or PFHxS+PFOS

Cardno now Stantec

Table 2 - Sediment Analytical Results

PFAS OMP
HMAS Stirling
Q2 2023

						oxylic Acids					PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perf		
						Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0002	0.0002	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0002	0.0005	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**												
WWTP	SD304	7/06/2023	0089_SD304_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
HSF	SD306	8/06/2023	0089_SD306_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
HSF	SD307	8/06/2023	0089_SD307_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
HSF	SD308	8/06/2023	0089_SD308_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
HSF	SD314	8/06/2023	0089_SD314_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
HSF	SD315	8/06/2023	0089_SD315_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
HSF	SD316	8/06/2023	0089_SD316_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
Demolition ground	SD329	7/06/2023	0089_SD329_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
Demolition ground	SD330	7/06/2023	0089_SD330_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
Demolition ground	SD331	7/06/2023	0089_SD331_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
FTA	SD335	7/06/2023	0089_SD335_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
FTA	SD340	7/06/2023	0089_SD340_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
FTA	SD341	7/06/2023	0089_SD341_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
WWTP	SD345	7/06/2023	0089_SD345_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
Accomodation Area	SD346	7/06/2023	0089_SD346_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
WWTP	SD350	7/06/2023	0089_SD350_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
WWTP	SD351	7/06/2023	0089_SD351_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
WWTP	SD352	7/06/2023	0089_SD352_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
Demolition ground	SD356	7/06/2023	0089_QC114_230607	Field Duplicate	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
Demolition ground	SD356	7/06/2023	0089_QC214_230607	Interlab Duplicate	997465	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01
Demolition ground	SD356	7/06/2023	0089_SD356_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
Demolition ground	SD357	7/06/2023	0089_SD357_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
Demolition ground	SD358	7/06/2023	0089_SD358_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
FTA	SD362	7/06/2023	0089_SD362_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
FTA	SD363	7/06/2023	0089_SD363_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
FTA	SD364	7/06/2023	0089_QC117_230607	Field Duplicate	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
FTA	SD364	7/06/2023	0089_QC217_230607	Interlab Duplicate	997465	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01
FTA	SD364	7/06/2023	0089_SD364_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
WWTP	SD367	7/06/2023	0089_SD367_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
WWTP	SD368	7/06/2023	0089_SD368_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
WWTP	SD369	7/06/2023	0089_QC113_230607	Field Duplicate	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
WWTP	SD369	7/06/2023	0089_QC213_230607	Interlab Duplicate	997465	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01
WWTP	SD369	7/06/2023	0089_SD369_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
	SD374	6/06/2023	0089_QC107_230606	Field Duplicate	EP2307435	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
	SD374	6/06/2023	0089_QC207_230606	Interlab Duplicate	997465	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01
Dredge spoil and careening bay	SD374	6/06/2023	0089_SD374_230606	Normal	EP2307435	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
	SD375	6/06/2023	0089_SD375_230606	Normal	EP2307435	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
	SD378	6/06/2023	0089_SD378_230606	Normal	EP2307435	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
WWTP	SD380	7/06/2023	0089_SD380_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
WWTP	SD381	7/06/2023	0089_SD381_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
WWTP	SD401	7/06/2023	0089_SD401_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
HSF	SD405	8/06/2023	0089_SD405_230608	Normal	EP2307591	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
HSF	SD407	8/06/2023	0089_SD407_230608	Normal	EP2307591	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
HSF	SD409	8/06/2023	0089_SD409_230608	Normal	EP2307591	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
HSF	SD411	8/06/2023	0089_SD411_230608	Normal	EP2307594	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
HSF	SD413	8/06/2023	0089_SD413_230608	Normal	EP2307594	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002
HSF	SD415	8/06/2023	0089_SD415_230608	Normal	EP2307594	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002

Notes:

First-time detection of PFOA or PFHxS+PFOS

						uoroalkyl Sulfonamides				PFAS		
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0005	0.0005	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**							
WWTP	SD304	7/06/2023	0089_SD304_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	8/06/2023	0089_SD306_230608	Normal	EP2307589	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	8/06/2023	0089_SD307_230608	Normal	EP2307589	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	8/06/2023	0089_SD308_230608	Normal	EP2307589	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	8/06/2023	0089_SD314_230608	Normal	EP2307589	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	8/06/2023	0089_SD315_230608	Normal	EP2307589	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	8/06/2023	0089_SD316_230608	Normal	EP2307589	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	SD329	7/06/2023	0089_SD329_230607	Normal	EP2307499	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	SD330	7/06/2023	0089_SD330_230607	Normal	EP2307499	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	SD331	7/06/2023	0089_SD331_230607	Normal	EP2307499	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	7/06/2023	0089_SD335_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	7/06/2023	0089_SD340_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
FTA	SD341	7/06/2023	0089_SD341_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD345	7/06/2023	0089_SD345_230607	Normal	EP2307495	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
Accomodation Area	SD346	7/06/2023	0089_SD346_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0002	<0.0005	0.0009	0.0009	0.0009
WWTP	SD350	7/06/2023	0089_SD350_230607	Normal	EP2307495	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD351	7/06/2023	0089_SD351_230607	Normal	EP2307495	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD352	7/06/2023	0089_SD352_230607	Normal	EP2307495	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	SD356	7/06/2023	0089_QC114_230607	Field Duplicate	EP2307499	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	SD356	7/06/2023	0089_QC214_230607	Interlab Duplicate	997465	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition ground	SD356	7/06/2023	0089_SD356_230607	Normal	EP2307499	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	SD357	7/06/2023	0089_SD357_230607	Normal	EP2307499	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	SD358	7/06/2023	0089_SD358_230607	Normal	EP2307499	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD362	7/06/2023	0089_SD362_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD363	7/06/2023	0089_SD363_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	7/06/2023	0089_QC117_230607	Field Duplicate	EP2307501	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	7/06/2023	0089_QC217_230607	Interlab Duplicate	997465	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD364	7/06/2023	0089_SD364_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD367	7/06/2023	0089_SD367_230607	Normal	EP2307495	<0.0005	<0.0005	<0.0002	<0.0005	0.0008	0.0008	0.0008
WWTP	SD368	7/06/2023	0089_SD368_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	SD369	7/06/2023	0089_QC113_230607	Field Duplicate	EP2307495	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD369	7/06/2023	0089_QC213_230607	Interlab Duplicate	997465	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
WWTP	SD369	7/06/2023	0089_SD369_230607	Normal	EP2307495	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD374	6/06/2023	0089_QC107_230606	Field Duplicate	EP2307435	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
	SD374	6/06/2023	0089_QC207_230606	Interlab Duplicate	997465	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Dredge spoil and careening bay	SD374	6/06/2023	0089_SD374_230606	Normal	EP2307435	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD375	6/06/2023	0089_SD375_230606	Normal	EP2307435	<0.0005	<0.0005	<0.0002	<0.0005	0.0030	0.0030	0.0030
	SD378	6/06/2023	0089_SD378_230606	Normal	EP2307435	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
WWTP	SD380	7/06/2023	0089_SD380_230607	Normal	EP2307495	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	7/06/2023	0089_SD381_230607	Normal	EP2307495	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD401	7/06/2023	0089_SD401_230607	Normal	EP2307495	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	8/06/2023	0089_SD405_230608	Normal	EP2307591	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	8/06/2023	0089_SD407_230608	Normal	EP2307591	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	8/06/2023	0089_SD409_230608	Normal	EP2307591	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	8/06/2023	0089_SD411_230608	Normal	EP2307594	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	8/06/2023	0089_SD413_230608	Normal	EP2307594	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	8/06/2023	0089_SD415_230608	Normal	EP2307594	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Notes:

First-time detection of PFOA or PFHxS+PFOS

Table 3 - Water samples RPDs

			Date	13 Mar 2023	06 Jun 2023		13 Mar 2023	06 Jun 2023		06 Jun 2023	06 Jun 2023		06 Jun 2023	06 Jun 2023	
			Field ID	0089_MW199_230313	0089_QC206_230606		0089_MW195S_230313	0089_QC209_230606		0089_MW112_230606	0089_QC104_230606		0089_MW112_230606	0089_QC204_230606	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2303084	997465	RPD	EP2303084	997465	RPD	EP2307463	EP2307463	RPD	EP2307463	997465	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.01	0	0.14	0.15	7	0.14	0.14	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.01	0	0.55	0.56	2	0.55	0.82	**39**
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	26.8	29.5	10	26.8	32	18
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.01	0	6.03	6.57	9	6.03	6.7	11
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	21.6	20.7	4	21.6	33	**42**
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05		<0.1	<0.05	0	<0.1	<0.05	0	0.1	0.2	67	0.1	0.17	52
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.01	0	0.43	0.46	7	0.43	0.46	7
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.01	0	2.83	3.20	12	2.83	2.5	12
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.01	0	0.56	0.60	7	0.56	0.59	5
Perfluorooctanoic acid (PFOA)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	4.38	5.20	17	4.38	4.9	11
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	0.05	86
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	0.29	0.33	13	0.29	0.30	3
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.05	0	0.11	0.10	10	0.11	0.06	59
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	48.4	50.2	4	48.4	65	**29**
Sum of PFAS (WA DER List)	µg/L	0.01		<0.01	<0.05	0	<0.01	<0.05	0	57.1	60.3	5	57.1	74.06	**26**
Sum of PFAS	µg/L	0.01		<0.01	<0.1	0	<0.01	<0.1	0	63.8	67.6	6	63.8	81.77	**25**

***RPDs have only been considered where a concentration is greater than 1 times the LOR.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

Cardno now Stantec

Table 3 - Water samples RPDs

PFAS OMP
HMAS Stirling
Q2 2023

			Date	06 Jun 2023	06 Jun 2023		06 Jun 2023	06 Jun 2023		06 Jun 2023	06 Jun 2023		06 Jun 2023	06 Jun 2023		06 Jun 2023	06 Jun 2023	
			Field ID	0089_MW123_230606	0089_QC101_230606		0089_MW123_230606	0089_QC201_230606		0089_MW120_230606	0089_QC103_230606		0089_MW120_230606	0089_QC203_230606		0089_MW259_230606	0089_QC102_230606	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2307463	EP2307463	RPD	EP2307463	997465	RPD	EP2307463	EP2307463	RPD	EP2307463	997465	RPD	EP2307433	EP2307433	RPD
	Unit	LOR																
PFAS - Perfluoroalkyl Sulfonic Acids																		
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		0.25	0.34	31	0.25	0.24	4	0.02	<0.02	0	0.02	0.02	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		0.19	0.30	45	0.19	0.26	**31**	0.05	0.05	0	0.05	0.06	18	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		1.64	2.35	**36**	1.64	1.9	15	1.98	2.33	16	1.98	2.2	11	0.10	0.11	10
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	0.31	0.45	**37**	0.31	0.25	**21**	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01		0.02	0.03	40	0.02	0.01	67	3.09	2.29	**30**	3.09	2.2	**34**	0.14	0.16	13
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																		
Perfluorobutanoic acid (PFBA)	µg/L	0.05		<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		0.04	0.06	40	0.04	0.04	0	0.04	0.02	67	0.04	0.03	29	0.14	0.14	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		0.22	0.34	43	0.22	0.25	13	0.16	0.13	21	0.16	0.13	21	0.11	0.10	10
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01		<0.02	0.03	40	<0.02	0.03	40	<0.02	<0.02	0	<0.02	0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01		<0.01	<0.01	0	<0.01	0.01	0	0.17	0.24	**34**	0.17	0.22	**26**	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																		
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																		
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																		
Sum of PFHxS and PFOS	µg/L	0.01		1.66	2.38	**36**	1.66	1.91	14	5.07	4.62	9	5.07	4.4	14	0.24	0.27	12
Sum of PFAS (WA DER List)	µg/L	0.01		2.17	3.15	**37**	2.17	2.48	13	5.46	5.01	9	5.46	4.81	13	0.49	0.51	4
Sum of PFAS	µg/L	0.01		2.36	3.45	**38**	2.36	2.81	17	5.82	5.51	5	5.82	5.12	13	0.49	0.51	4

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Table 3 - Water samples RPDs

PFAS OMP
HMAS Stirling
Q2 2023

		Date	06 Jun 2023	06 Jun 2023		06 Jun 2023	06 Jun 2023		06 Jun 2023	06 Jun 2023		06 Jun 2023	06 Jun 2023		06 Jun 2023	06 Jun 2023	
		Field ID	0089_MW259_230606	0089_QC202_230606		0089_SW319_230606	0089_QC105_230606		0089_SW319_230606	0089_QC205_230606		0089_MW199_230606	0089_QC106_230606		0089_PW374_230606	0089_QC108_230606	
		Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
		Lab Report Number	EP2307433	997465	RPD	EP2307434	EP2307434	RPD	EP2307434	997465	RPD	EP2307415	EP2307415	RPD	EP2307434	EP2307463	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.10	0.11	10	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.14	0.06	**80**	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	0.07	0.12	**53**
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0.14	0.13	7	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0.11	0.08	32	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	0.24	0.17	**34**	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	0.07	0.12	**53**
Sum of PFAS (WA DER List)	µg/L	0.01	0.49	0.39	**23**	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	0.07	0.12	**53**
Sum of PFAS	µg/L	0.01	0.49	0.4	20	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0	0.07	0.12	**53**

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Table 3 - Water samples RPDs

PFAS OMP
HMAS Stirling
Q2 2023

			Date	06 Jun 2023	06 Jun 2023		06 Jun 2023	06 Jun 2023		07 Jun 2023	07 Jun 2023		07 Jun 2023	07 Jun 2023		07 Jun 2023	07 Jun 2023	
			Field ID	0089_PW374_230606	0089_QC208_230606		0089_MW195S_230606	0089_QC109_230606		0089_MW139_230607	0089_QC110_230607		0089_MW139_230607	0089_QC210_230607		0089_PW367_230607	0089_QC111_230607	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2307434	997465	RPD	EP2307415	EP2307415	RPD	EP2307497	EP2307497	RPD	EP2307497	997465	RPD	EP2307493	EP2307493	RPD
	Unit	LOR																
PFAS - Perfluoroalkyl Sulfonic Acids																		
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01		0.07	0.05	33	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	0.04	0.02	67
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																		
Perfluorobutanoic acid (PFBA)	µg/L	0.05		<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																		
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																		
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02		<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																		
Sum of PFHxS and PFOS	µg/L	0.01		0.07	0.05	33	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	0.04	0.02	67
Sum of PFAS (WA DER List)	µg/L	0.01		0.07	0.05	33	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.05	0	0.04	0.02	67
Sum of PFAS	µg/L	0.01		0.07	<0.1	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.1	0	0.04	0.02	67

Date			07 Jun 2023	07 Jun 2023		07 Jun 2023	07 Jun 2023		07 Jun 2023	07 Jun 2023		07 Jun 2023	07 Jun 2023		07 Jun 2023	07 Jun 2023	
Field ID			0089_PW367_230607	0089_QC211_230607		0089_SW370_230607	0089_QC112_230607		0089_SW370_230607	0089_QC212_230607		0089_SW150_230607	0089_QC115_230607		0089_SW150_230607	0089_QC215_230607	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2307493	997465	RPD	EP2307493	EP2307493	RPD	EP2307493	997465	RPD	EP2307498	EP2307498	RPD	EP2307498	997465	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.04	0.02	67	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	0.11	75	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	0.04	0.02	67	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	0.04	0.13	106	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0
Sum of PFAS	µg/L	0.01	0.04	0.13	106	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0

Date			07 Jun 2023	07 Jun 2023		07 Jun 2023	07 Jun 2023		07 Jun 2023	07 Jun 2023		07 Jun 2023	07 Jun 2023	
Field ID			0089_PW356_230607	0089_QC116_230607		0089_PW356_230607	0089_QC216_230607		0089_PW364_230607	0089_QC118_230607		0089_PW364_230607	0089_QC218_230607	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number	Unit	LOR	EP2307498	EP2307498	RPD	EP2307498	997465	RPD	EP2307502	EP2307502	RPD	EP2307502	997465	RPD
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.02	0.02	0	0.02	<0.01	67
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS														
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.02	0.02	0	0.02	<0.01	67
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	0.02	0.02	0	0.02	<0.05	0
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.1	0	0.02	0.02	0	0.02	<0.1	0

			Date	06 Jun 2023	06 Jun 2023		06 Jun 2023	06 Jun 2023		07 Jun 2023	07 Jun 2023		07 Jun 2023	07 Jun 2023	
			Field ID	0089_SD374_230606	0089_QC107_230606		0089_SD374_230606	0089_QC207_230606		0089_SD356_230607	0089_QC114_230607		0089_SD356_230607	0089_QC214_230607	
			Matrix Type	Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
			Lab Report Number	EP2307435	EP2307435	RPD	EP2307435	997465	RPD	EP2307499	EP2307499	RPD	EP2307499	997465	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002		0.0003	0.0005	50	0.0003	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	mg/kg	0.001		<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS															
Sum of PFHxS and PFOS	mg/kg	0.0002		0.0003	0.0005	50	0.0003	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002		0.0003	0.0005	50	0.0003	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
Sum of PFAS	mg/kg	0.0002		0.0003	0.0005	50	0.0003	<0.05	0	<0.0002	<0.0002	0	<0.0002	<0.05	0

**RPDs have only been considered where a concentration is greater than 1 times the LOR.
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

		07 Jun 2023	07 Jun 2023		07 Jun 2023	07 Jun 2023		07 Jun 2023	07 Jun 2023		07 Jun 2023	07 Jun 2023	
		0089_SD369_230607	0089_QC113_230607		0089_SD369_230607	0089_QC213_230607		0089_SD364_230607	0089_QC117_230607		0089_SD364_230607	0089_QC217_230607	
		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
		EP2307495	EP2307495	RPD	EP2307495	997465	RPD	EP2307501	EP2307501	RPD	EP2307501	997465	RPD
	Unit												
PFAS - Perfluoroalkyl Sulfonic Acids													
Perfluorobutane sulfonic acid (PFBS)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecane sulfonic acid (PFDS)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids													
Perfluorobutanoic acid (PFBA)	mg/kg	<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids													
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides													
Perfluorooctane sulfonamide (FOSA)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS													
Sum of PFHxS and PFOS	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
Sum of PFAS	mg/kg	<0.0002	<0.0002	0	<0.0002	<0.05	0	<0.0002	<0.0002	0	<0.0002	<0.05	0

*RPDs have only been considered where a concentration
**Elevated RPDs are highlighted as per QAQC Profile sett
***Interlab Duplicates are matched on a per compound l

APPENDIX

C

LABORATORY CERTIFICATES

Cardno

now

Stantec

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2307415

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

Phone: [redacted]

53205 53208 53210 53216

ALS Compass COC Reference: 53215 **# Samples:** **Sampler:** [redacted]

Phone: [redacted]

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 7/6/23 8:00	Date / Time: 7/6 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 53215 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW199		06/06/2023 12:38 PM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC106		06/06/2023 12:44 PM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW195S		06/06/2023 01:26 PM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_QC109		06/06/2023 01:26 PM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW195D		06/06/2023 01:30 PM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_MW193		06/06/2023 01:31 PM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_MW173		06/06/2023 02:37 PM	WATER	ALS: 3 Non ALS: 0	No	X		
008	0089_MW203		06/06/2023 02:45 PM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_MW233		06/06/2023 02:57 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 53215 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW289		06/06/2023 03:17 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 53215 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW199	HDPE (no PTFE)	20 mL	00350822082330	Grey	No	
001	0089_MW199	HDPE (no PTFE)	20 mL	00350822082392	Grey	No	
001	0089_MW199	Clear Plastic Bottle - Natural	125 mL	00070522054874	Green	No	
002	0089_QC106	HDPE (no PTFE)	20 mL	00350822082846	Grey	No	
002	0089_QC106	HDPE (no PTFE)	20 mL	00350822082659	Grey	No	
002	0089_QC106	Clear Plastic Bottle - Natural	125 mL	00070522054893	Green	No	
003	0089_MW195S	Clear Plastic Bottle - Natural	125 mL	00070522067383	Green	No	
003	0089_MW195S	HDPE (no PTFE)	20 mL	00350822082567	Grey	No	
003	0089_MW195S	HDPE (no PTFE)	20 mL	00350822082446	Grey	No	
004	0089_QC109	HDPE (no PTFE)	20 mL	00350822082877	Grey	No	
004	0089_QC109	HDPE (no PTFE)	20 mL	00350822082646	Grey	No	
004	0089_QC109	Clear Plastic Bottle - Natural	125 mL	00070522054795	Green	No	
005	0089_MW195D	Clear Plastic Bottle - Natural	125 mL	00070522054940	Green	No	
005	0089_MW195D	HDPE (no PTFE)	20 mL	00350822082327	Grey	No	
005	0089_MW195D	HDPE (no PTFE)	20 mL	00350822082342	Grey	No	
006	0089_MW193	Clear Plastic Bottle - Natural	125 mL	00070522054726	Green	No	
006	0089_MW193	HDPE (no PTFE)	20 mL	00350822082347	Grey	No	
006	0089_MW193	HDPE (no PTFE)	20 mL	00350822082368	Grey	No	
007	0089_MW173	Clear Plastic Bottle - Natural	125 mL	00070522054886	Green	No	
007	0089_MW173	HDPE (no PTFE)	20 mL	00350822082625	Grey	No	
007	0089_MW173	HDPE (no PTFE)	20 mL	00350822082872	Grey	No	
008	0089_MW203	Clear Plastic Bottle - Natural	125 mL	00070522054779	Green	No	
008	0089_MW203	HDPE (no PTFE)	20 mL	00350822082598	Grey	No	
008	0089_MW203	HDPE (no PTFE)	20 mL	00350822082578	Grey	No	
009	0089_MW233	Clear Plastic Bottle - Natural	125 mL	00070522054861	Green	No	
009	0089_MW233	HDPE (no PTFE)	20 mL	00350822082606	Grey	No	

CHAIN OF CUSTODY

COC#: 53215 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

009	0089_MW233	HDPE (no PTFE)	20 mL	00350822082422	Grey	No	
010	0089_MW289	Clear Plastic Bottle - Natural	125 mL	00070522054872	Green	No	
010	0089_MW289	HDPE (no PTFE)	20 mL	00350822082488	Grey	No	
010	0089_MW289	HDPE (no PTFE)	20 mL	00350822082580	Grey	No	

Total Bottle Count: ALS: 30, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307415**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53215	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - [redacted]		
Sampler	: [redacted]		

Dates

Date Samples Received	: 07-Jun-2023 12:00	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 16-Jun-2023	Scheduled Reporting Date	: **16-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 11.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307415-001	06-Jun-2023 12:38	0089_MW199_230606	✓	✓
EP2307415-002	06-Jun-2023 12:44	0089_QC106_230606	✓	✓
EP2307415-003	06-Jun-2023 13:26	0089_MW195S_230606	✓	✓
EP2307415-004	06-Jun-2023 13:26	0089_QC109_230606	✓	✓
EP2307415-005	06-Jun-2023 13:30	0089_MW195D_230606	✓	✓
EP2307415-006	06-Jun-2023 13:31	0089_MW193_230606	✓	✓
EP2307415-007	06-Jun-2023 14:37	0089_MW173_230606	✓	✓
EP2307415-008	06-Jun-2023 14:45	0089_MW203_230606	✓	✓
EP2307415-009	06-Jun-2023 14:57	0089_MW233_230606	✓	✓
EP2307415-010	06-Jun-2023 15:17	0089_MW289_230606	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307415**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Jun-2023
C-O-C number	: 53215	Issue Date	: 16-Jun-2023 20:41
Sampler	: [redacted]		
Site	: Stirling GW - [redacted]		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits for sample #10 due to analytes not quantified in this report. Major cations (ED093F) and major anions (ED041G/ED045G) have been confirmed by re-analysis.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW199_230606	0089_QC106_230606	0089_MW195S_230606	0089_QC109_230606	0089_MW195D_230606
				Sampling date / time	06-Jun-2023 12:38	06-Jun-2023 12:44	06-Jun-2023 13:26	06-Jun-2023 13:26	06-Jun-2023 13:30
					EP2307415-001	EP2307415-002	EP2307415-003	EP2307415-004	EP2307415-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**364**	**371**	**587**	**588**	**166**
Total Alkalinity as CaCO3	----	1	mg/L		**364**	**371**	**587**	**588**	**166**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**58**	**60**	**279**	**280**	**1760**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**340**	**372**	**900**	**904**	**11600**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**89**	**87**	**164**	**164**	**389**
Magnesium	7439-95-4	1	mg/L		**42**	**43**	**113**	**114**	**819**
Sodium	7440-23-5	1	mg/L		**234**	**258**	**620**	**617**	**7440**
Potassium	7440-09-7	1	mg/L		**10**	**11**	**35**	**35**	**262**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**18.1**	**19.2**	**42.9**	**43.1**	**367**
ø Total Cations	----	0.01	meq/L		**18.3**	**19.4**	**45.3**	**45.3**	**417**
ø Ionic Balance	----	0.01	%		**0.72**	**0.59**	**2.74**	**2.51**	**6.37**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW199_230606	0089_QC106_230606	0089_MW195S_230606	0089_QC109_230606	0089_MW195D_230606
				Sampling date / time	06-Jun-2023 12:38	06-Jun-2023 12:44	06-Jun-2023 13:26	06-Jun-2023 13:26	06-Jun-2023 13:30
					EP2307415-001	EP2307415-002	EP2307415-003	EP2307415-004	EP2307415-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW199_230606	0089_QC106_230606	0089_MW195S_230606	0089_QC109_230606	0089_MW195D_230606
				Sampling date / time	06-Jun-2023 12:38	06-Jun-2023 12:44	06-Jun-2023 13:26	06-Jun-2023 13:26	06-Jun-2023 13:30
Compound	CAS Number	LOR	Unit		EP2307415-001	EP2307415-002	EP2307415-003	EP2307415-004	EP2307415-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.2**	**95.5**	**112**	**107**	**97.2**
13C8-PFOA	----	0.02	%		**104**	**103**	**102**	**103**	**105**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW193_230606	0089_MW173_230606	0089_MW203_230606	0089_MW233_230606	0089_MW289_230606
				Sampling date / time	06-Jun-2023 13:31	06-Jun-2023 14:37	06-Jun-2023 14:45	06-Jun-2023 14:57	06-Jun-2023 15:17
Compound	CAS Number	LOR	Unit		EP2307415-006	EP2307415-007	EP2307415-008	EP2307415-009	EP2307415-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		746	420	282	93	489
Total Alkalinity as CaCO3	----	1	mg/L		746	420	282	93	489
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		108	96	76	4	39
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		534	821	60	20	88
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		93	134	70	25	85
Magnesium	7439-95-4	1	mg/L		80	90	41	3	25
Sodium	7440-23-5	1	mg/L		372	528	50	16	81
Potassium	7440-09-7	1	mg/L		15	23	6	1	6
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		32.2	33.5	8.91	2.50	13.1
ø Total Cations	----	0.01	meq/L		27.8	37.6	9.20	2.22	9.98
ø Ionic Balance	----	0.01	%		7.38	5.76	1.58	6.13	13.4
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.31	0.14	<0.02	<0.02	0.04
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.38	0.09	<0.02	<0.02	0.05
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		4.11	1.93	0.04	<0.01	0.56
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.31	0.36	<0.02	<0.02	0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		1.90	3.99	<0.01	0.04	1.40
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.14	0.08	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		0.69	0.29	<0.02	<0.02	0.03

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW193_230606	0089_MW173_230606	0089_MW203_230606	0089_MW233_230606	0089_MW289_230606
				Sampling date / time	06-Jun-2023 13:31	06-Jun-2023 14:37	06-Jun-2023 14:45	06-Jun-2023 14:57	06-Jun-2023 15:17
Compound	CAS Number	LOR	Unit		EP2307415-006	EP2307415-007	EP2307415-008	EP2307415-009	EP2307415-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.06**	**0.04**	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.30**	**0.22**	<0.01	<0.01	**0.02**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW193_230606	0089_MW173_230606	0089_MW203_230606	0089_MW233_230606	0089_MW289_230606
				Sampling date / time	06-Jun-2023 13:31	06-Jun-2023 14:37	06-Jun-2023 14:45	06-Jun-2023 14:57	06-Jun-2023 15:17
Compound	CAS Number	LOR	Unit		EP2307415-006	EP2307415-007	EP2307415-008	EP2307415-009	EP2307415-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**8.20**	**7.14**	**0.04**	**0.04**	**2.12**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**6.01**	**5.92**	**0.04**	**0.04**	**1.96**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**7.51**	**6.69**	**0.04**	**0.04**	**2.05**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.0**	**95.1**	**95.0**	**103**	**89.7**
13C8-PFOA	----	0.02	%		**107**	**102**	**102**	**105**	**96.7**

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	***Low***	***High***
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307415**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Jun-2023
C-O-C number	: 53215	Issue Date	: 16-Jun-2023
Sampler	: [redacted]		
Site	: Stirling GW - [redacted]		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5105215)									
EP2307415-002	0089_QC106_230606	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	371	370	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	371	370	0.0	0% - 20%
EP2307433-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	525	524	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	525	524	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5104216)									
EP2307415-001	0089_MW199_230606	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	58	57	0.0	0% - 20%
EP2307433-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	37	36	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5104217)									
EP2307415-001	0089_MW199_230606	ED045G: Chloride	16887-00-6	1	mg/L	340	339	0.0	0% - 20%
EP2307433-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	61	61	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5105903)									
EP2307415-001	0089_MW199_230606	ED093F: Calcium	7440-70-2	1	mg/L	89	89	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	42	42	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	234	234	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	10	10	0.0	0% - 50%
EP2307433-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	83	84	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	11	11	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	50	50	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107825)									
EP2307433-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	8.00	8.84	9.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	11.2	12.0	7.2	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.77	0.79	3.0	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.76	0.77	0.0	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.35	0.38	8.7	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107825)									
EP2307433-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.67	0.58	14.4	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.45	0.49	7.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.73	1.78	3.3	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.19	0.21	9.5	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.3	0.4	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107825)									
EP2307433-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	0.08	0.08	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107825)									
EP2307433-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.13	0.14	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107825) - continued									
EP2307433-002	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107825)									
EP2307433-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	24.6	26.5	7.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	19.2	20.8	8.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	23.4	25.2	7.4	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5105215)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.8	87.8	118
				<1	200 mg/L	97.2	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104216)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.2	89.9	112
				<1	500 mg/L	103	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5104217)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	107	88.6	113
				<1	1000 mg/L	95.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5105903)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100.0	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.5	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107825)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	93.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	98.1	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	89.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	98.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107825)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	92.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.1	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	88.7	69.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107825) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	91.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.3	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	97.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107825)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	101	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	94.2	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	94.7	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107825)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	96.0	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	100.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	86.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	93.2	64.2	133
EP231P: PFAS Sums (QCLot: 5107825)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104216)							
EP2307415-001	0089_MW199_230606	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	113	70.4	130

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
ED045G: Chloride by Discrete Analyser (QCLot: 5104217)							
EP2307415-001	0089_MW199_230606	ED045G: Chloride	16887-00-6	1000 mg/L	104	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107825)							
EP2307433-010	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	108	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	122	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	97.9	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	95.6	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107825)							
EP2307433-010	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	85.6	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	98.7	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	97.5	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	84.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	75.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	93.9	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	102	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	94.3	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	97.5	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	106	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	101	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107825)							
EP2307433-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	91.0	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	99.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	101	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	97.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	93.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	89.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	96.9	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107825)							
EP2307433-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	94.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	107	64.0	140

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107825) - continued							
EP2307433-010	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	89.4	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	91.4	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307415**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023
Site	: Stirling GW - [redacted]	Issue Date	: 16-Jun-2023
Sampler	: [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2307433--010	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2307433--010	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_MW199_230606,	0089_QC106_230606,	----	----	----	14-Jun-2023	13-Jun-2023	**1**
0089_MW195S_230606,	0089_QC109_230606,						
0089_MW195D_230606,	0089_MW193_230606,						
0089_MW173_230606,	0089_MW203_230606,						
0089_MW233_230606,	0089_MW289_230606						

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
	1				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	19	5.26	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW199_230606, 0089_QC106_230606, 0089_MW195S_230606, 0089_QC109_230606, 0089_MW195D_230606, 0089_MW193_230606, 0089_MW173_230606, 0089_MW203_230606, 0089_MW233_230606, 0089_MW289_230606	**06-Jun-2023**	**----**	----	----	**12-Jun-2023**	20-Jun-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW199_230606, 0089_QC106_230606, 0089_MW195S_230606, 0089_QC109_230606, 0089_MW195D_230606, 0089_MW193_230606, 0089_MW173_230606, 0089_MW203_230606, 0089_MW233_230606, 0089_MW289_230606	**06-Jun-2023**	**----**	----	----	**16-Jun-2023**	04-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW199_230606, 0089_QC106_230606, 0089_MW195S_230606, 0089_QC109_230606, 0089_MW195D_230606, 0089_MW193_230606, 0089_MW173_230606, 0089_MW203_230606, 0089_MW233_230606, 0089_MW289_230606	**06-Jun-2023**	**----**	----	----	**16-Jun-2023**	04-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW199_230606, 0089_QC106_230606, 0089_MW195S_230606, 0089_QC109_230606, 0089_MW195D_230606, 0089_MW193_230606, 0089_MW173_230606, 0089_MW203_230606, 0089_MW233_230606, 0089_MW289_230606	**06-Jun-2023**	**----**	----	----	**14-Jun-2023**	13-Jun-2023	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW199_230606, 0089_QC106_230606, 0089_MW195S_230606, 0089_QC109_230606, 0089_MW195D_230606, 0089_MW193_230606, 0089_MW173_230606, 0089_MW203_230606, 0089_MW233_230606, 0089_MW289_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW199_230606, 0089_QC106_230606, 0089_MW195S_230606, 0089_QC109_230606, 0089_MW195D_230606, 0089_MW193_230606, 0089_MW173_230606, 0089_MW203_230606, 0089_MW233_230606, 0089_MW289_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW199_230606, 0089_MW195S_230606, 0089_MW195D_230606, 0089_MW173_230606, 0089_MW233_230606, 0089_QC106_230606, 0089_QC109_230606, 0089_MW193_230606, 0089_MW203_230606, 0089_MW289_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW199_230606, 0089_MW195S_230606, 0089_MW195D_230606, 0089_MW173_230606, 0089_MW233_230606, 0089_QC106_230606, 0089_QC109_230606, 0089_MW193_230606, 0089_MW203_230606, 0089_MW289_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW199_230606, 0089_MW195S_230606, 0089_MW195D_230606, 0089_MW173_230606, 0089_MW233_230606, 0089_QC106_230606, 0089_QC109_230606, 0089_MW193_230606, 0089_MW203_230606, 0089_MW289_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING Intelligence

Perth
Work Order Reference
EP2307433

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 Client: Stantec Project Manager: [redacted]

Phone: ( )

ALS Compass COC Reference: 53205 53208 53210 53216 53215 # Samples: Sampler: [redacted]

Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 7/6/23 8:00	Date / Time: 7/6 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 53208 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW255		06/06/2023 11:46 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_MW256		06/06/2023 11:47 AM	WATER	ALS: 5 Non ALS: 0	No	X		
003	0089_MW259		06/06/2023 11:48 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW236		06/06/2023 11:49 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_QC102		06/06/2023 11:49 AM	WATER	ALS: 2 Non ALS: 0	No	Partial 1/2		
006	0089_MW257		06/06/2023 11:50 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_MW258		06/06/2023 11:51 AM	WATER	ALS: 3 Non ALS: 0	No	X		
008	0089_MW269		06/06/2023 01:39 PM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_MW268		06/06/2023 01:39 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 53208 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW496		06/06/2023 02:12 PM	WATER	ALS: 5 Non ALS: 0	No	X		
011	0089_MW516		06/06/2023 02:13 PM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_MW249		06/06/2023 02:58 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) *COC#:* **53208** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
005	0089_QC102	WA OMP Water Suite WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 53208 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW255	Clear Plastic Bottle - Natural	125 mL	00070522054709	Green	No	
001	0089_MW255	HDPE (no PTFE)	20 mL	00350822082638	Grey	No	
001	0089_MW255	HDPE (no PTFE)	20 mL	00350822082728	Grey	No	
002	0089_MW256	HDPE (no PTFE)	20 mL	00350822082533	Grey	No	
002	0089_MW256	HDPE (no PTFE)	20 mL	00350822082366	Grey	No	
002	0089_MW256	Clear Plastic Bottle - Natural	125 mL	00070522054898	Green	No	
002	0089_MW256	HDPE (no PTFE)	20 mL	00350822082377	Grey	No	
002	0089_MW256	HDPE (no PTFE)	20 mL	00350822082555	Grey	No	
003	0089_MW259	Clear Plastic Bottle - Natural	125 mL	00070522054708	Green	No	
003	0089_MW259	HDPE (no PTFE)	20 mL	00350822082400	Grey	No	
003	0089_MW259	HDPE (no PTFE)	20 mL	00350822082315	Grey	No	
004	0089_MW236	Clear Plastic Bottle - Natural	125 mL	00070522054853	Green	No	
004	0089_MW236	HDPE (no PTFE)	20 mL	00350822082899	Grey	No	
004	0089_MW236	HDPE (no PTFE)	20 mL	00350822082886	Grey	No	
005	0089_QC102	HDPE (no PTFE)	20 mL	00350822082328	Grey	No	
005	0089_QC102	HDPE (no PTFE)	20 mL	00350822082409	Grey	No	
006	0089_MW257	Clear Plastic Bottle - Natural	125 mL	00070522054791	Green	No	
006	0089_MW257	HDPE (no PTFE)	20 mL	00350822082573	Grey	No	
006	0089_MW257	HDPE (no PTFE)	20 mL	00350822082504	Grey	No	
007	0089_MW258	Clear Plastic Bottle - Natural	125 mL	00070522054710	Green	No	
007	0089_MW258	HDPE (no PTFE)	20 mL	00350822082476	Grey	No	
007	0089_MW258	HDPE (no PTFE)	20 mL	00350822082524	Grey	No	
008	0089_MW269	HDPE (no PTFE)	20 mL	00350822082823	Grey	No	
008	0089_MW269	HDPE (no PTFE)	20 mL	00350822082717	Grey	No	
008	0089_MW269	Clear Plastic Bottle - Natural	125 mL	00070522054816	Green	No	
009	0089_MW268	Clear Plastic Bottle - Natural	125 mL	00070522054789	Green	No	

Tuesday, June 6, 2023 9:24:31 PM

CHAIN OF CUSTODY

COC#: 53208 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW268	HDPE (no PTFE)	20 mL	00350822082648	Grey	No	
009	0089_MW268	HDPE (no PTFE)	20 mL	00350822082715	Grey	No	
010	0089_MW496	HDPE (no PTFE)	20 mL	00350822082420	Grey	No	
010	0089_MW496	Clear Plastic Bottle - Natural	125 mL	00070522054838	Green	No	
010	0089_MW496	HDPE (no PTFE)	20 mL	00350822082605	Grey	No	
010	0089_MW496	HDPE (no PTFE)	20 mL	00350822082411	Grey	No	
010	0089_MW496	HDPE (no PTFE)	20 mL	00350822082429	Grey	No	
010	0089_MW496	HDPE (no PTFE)	20 mL	00350822082862	Grey	No	
011	0089_MW516	Clear Plastic Bottle - Natural	125 mL	00070522054802	Green	No	
011	0089_MW516	HDPE (no PTFE)	20 mL	00350822082820	Grey	No	
011	0089_MW516	HDPE (no PTFE)	20 mL	00350822082684	Grey	No	
012	0089_MW249	HDPE (no PTFE)	20 mL	00350822082727	Grey	No	
012	0089_MW249	Clear Plastic Bottle - Natural	125 mL	00070522054866	Green	No	

Total Bottle Count: ALS: 39, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307433**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53208	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 07-Jun-2023 12:00	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 16-Jun-2023	Scheduled Reporting Date	: **16-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 11.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 12 / 12

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307433-001	06-Jun-2023 11:46	0089_MW255_230606	✓	✓
EP2307433-002	06-Jun-2023 11:47	0089_MW256_230606	✓	✓
EP2307433-003	06-Jun-2023 11:48	0089_MW259_230606	✓	✓
EP2307433-004	06-Jun-2023 11:49	0089_MW236_230606	✓	✓
EP2307433-005	06-Jun-2023 11:49	0089_QC102_230606	✓	
EP2307433-006	06-Jun-2023 11:50	0089_MW257_230606	✓	✓
EP2307433-007	06-Jun-2023 11:51	0089_MW258_230606	✓	✓
EP2307433-008	06-Jun-2023 13:39	0089_MW269_230606	✓	✓
EP2307433-009	06-Jun-2023 13:39	0089_MW268_230606	✓	✓
EP2307433-010	06-Jun-2023 14:12	0089_MW496_230606	✓	✓
EP2307433-011	06-Jun-2023 14:13	0089_MW516_230606	✓	✓
EP2307433-012	06-Jun-2023 14:58	0089_MW249_230606	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307433**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Jun-2023
C-O-C number	: 53208	Issue Date	: 19-Jun-2023 12:54
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits for sample #6, 7 and 10 due to analytes not quantified in this report. Major cations (ED093F) and major anions (ED041G/ED045G) have been confirmed by re-analysis.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW255_230606	0089_MW256_230606	0089_MW259_230606	0089_MW236_230606	0089_QC102_230606
				Sampling date / time	06-Jun-2023 11:46	06-Jun-2023 11:47	06-Jun-2023 11:48	06-Jun-2023 11:49	06-Jun-2023 11:49
Compound	CAS Number	LOR	Unit		EP2307433-001	EP2307433-002	EP2307433-003	EP2307433-004	EP2307433-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**260**	**525**	**268**	**324**	----
Total Alkalinity as CaCO3	----	1	mg/L		**260**	**525**	**268**	**324**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**37**	**19**	**10**	**18**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**61**	**239**	**22**	**29**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**83**	**110**	**68**	**87**	----
Magnesium	7439-95-4	1	mg/L		**11**	**55**	**12**	**16**	----
Sodium	7440-23-5	1	mg/L		**50**	**141**	**15**	**20**	----
Potassium	7440-09-7	1	mg/L		**4**	**5**	**2**	<1	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**7.68**	**17.6**	**6.18**	**7.67**	----
ø **Total Cations**	----	0.01	meq/L		**7.32**	**16.3**	**5.08**	**6.53**	----
ø **Ionic Balance**	----	0.01	%		**2.41**	**3.98**	**9.75**	**8.02**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.40**	**0.77**	<0.02	**0.16**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.47**	**0.76**	<0.02	**0.21**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**7.58**	**8.00**	**0.10**	**17.0**	**0.11**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.35**	<0.02	**0.63**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.32**	**11.2**	**0.14**	**52.3**	**0.16**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.1**	**0.3**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.18**	**0.45**	**0.14**	**0.12**	**0.14**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.95**	**1.73**	**0.11**	**0.60**	**0.10**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW255_230606	0089_MW256_230606	0089_MW259_230606	0089_MW236_230606	0089_QC102_230606
				Sampling date / time	06-Jun-2023 11:46	06-Jun-2023 11:47	06-Jun-2023 11:48	06-Jun-2023 11:49	06-Jun-2023 11:49
Compound	CAS Number	LOR	Unit		EP2307433-001	EP2307433-002	EP2307433-003	EP2307433-004	EP2307433-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.14**	**0.19**	<0.02	**0.27**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.04**	**0.67**	<0.01	**1.99**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.02**	<0.02	**2.91**	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	**0.08**	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	**0.13**	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW255_230606	0089_MW256_230606	0089_MW259_230606	0089_MW236_230606	0089_QC102_230606
				Sampling date / time	06-Jun-2023 11:46	06-Jun-2023 11:47	06-Jun-2023 11:48	06-Jun-2023 11:49	06-Jun-2023 11:49
Compound	CAS Number	LOR	Unit		EP2307433-001	EP2307433-002	EP2307433-003	EP2307433-004	EP2307433-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**10.2**	**24.6**	**0.49**	**76.2**	**0.51**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**7.90**	**19.2**	**0.24**	**69.3**	**0.27**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**9.71**	**23.4**	**0.49**	**72.4**	**0.51**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**98.6**	**104**	**107**	**94.9**
13C8-PFOA	----	0.02	%		**102**	**102**	**102**	**101**	**100**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW257_230606	0089_MW258_230606	0089_MW269_230606	0089_MW268_230606	0089_MW496_230606
				Sampling date / time	06-Jun-2023 11:50	06-Jun-2023 11:51	06-Jun-2023 13:39	06-Jun-2023 13:39	06-Jun-2023 14:12
Compound	CAS Number	LOR	Unit		EP2307433-006	EP2307433-007	EP2307433-008	EP2307433-009	EP2307433-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**244**	**130**	**393**	**426**	**571**
Total Alkalinity as CaCO3	----	1	mg/L		**244**	**130**	**393**	**426**	**571**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**8**	**73**	**114**	**886**	**44**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**14**	**279**	**258**	**3260**	**253**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**52**	**150**	**68**	**232**	**70**
Magnesium	7439-95-4	1	mg/L		**8**	**50**	**53**	**320**	**39**
Sodium	7440-23-5	1	mg/L		**12**	**128**	**199**	**2190**	**198**
Potassium	7440-09-7	1	mg/L		**2**	**18**	**13**	**89**	**15**
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**5.44**	**12.0**	**17.5**	**119**	**19.5**
ø **Total Cations**	----	0.01	meq/L		**3.83**	**17.6**	**16.7**	**135**	**15.7**
ø **Ionic Balance**	----	0.01	%		**17.4**	**19.0**	**2.22**	**6.50**	**10.7**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**2.35**	**0.05**	**0.07**	**0.10**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**2.04**	**0.07**	**0.07**	**0.12**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.38**	**5.09**	**0.30**	**0.29**	**1.06**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.29**	<0.02	<0.02	**0.09**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.10**	**6.73**	**0.35**	**0.01**	**8.16**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**1.2**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.11**	**2.61**	**0.02**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.06**	**2.98**	**0.09**	**0.04**	**0.17**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW257_230606	0089_MW258_230606	0089_MW269_230606	0089_MW268_230606	0089_MW496_230606
				Sampling date / time	06-Jun-2023 11:50	06-Jun-2023 11:51	06-Jun-2023 13:39	06-Jun-2023 13:39	06-Jun-2023 14:12
Compound	CAS Number	LOR	Unit		EP2307433-006	EP2307433-007	EP2307433-008	EP2307433-009	EP2307433-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.49**	<0.02	<0.02	**0.03**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.02**	**0.34**	<0.01	<0.01	**0.10**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	**0.31**	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW257_230606	0089_MW258_230606	0089_MW269_230606	0089_MW268_230606	0089_MW496_230606
				Sampling date / time	06-Jun-2023 11:50	06-Jun-2023 11:51	06-Jun-2023 13:39	06-Jun-2023 13:39	06-Jun-2023 14:12
Compound	CAS Number	LOR	Unit		EP2307433-006	EP2307433-007	EP2307433-008	EP2307433-009	EP2307433-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.67**	**24.4**	**0.88**	**0.48**	**9.83**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.48**	**11.8**	**0.65**	**0.30**	**9.22**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.67**	**22.1**	**0.81**	**0.41**	**9.62**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**107**	**97.8**	**104**	**96.8**
13C8-PFOA	----	0.02	%		**99.5**	**102**	**97.9**	**94.9**	**100**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW516_230606	0089_MW249_230606	----	----	----
				Sampling date / time	06-Jun-2023 14:13	06-Jun-2023 14:58	----	----	----
Compound	CAS Number	LOR	Unit		EP2307433-011	EP2307433-012	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**482**	**439**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**482**	**439**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**16**	**59**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**73**	**155**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**92**	**94**	----	----	----
Magnesium	7439-95-4	1	mg/L		**37**	**38**	----	----	----
Sodium	7440-23-5	1	mg/L		**73**	**116**	----	----	----
Potassium	7440-09-7	1	mg/L		**8**	**8**	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**12.0**	**14.4**	----	----	----
ø **Total Cations**	----	0.01	meq/L		**11.0**	**13.1**	----	----	----
ø **Ionic Balance**	----	0.01	%		**4.37**	**4.75**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.02**	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.03**	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.59**	**0.21**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.11**	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**8.70**	**0.03**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.08**	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW516_230606	0089_MW249_230606	----	----	----
				Sampling date / time	06-Jun-2023 14:13	06-Jun-2023 14:58	----	----	----
Compound	CAS Number	LOR	Unit		EP2307433-011	EP2307433-012	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.08**	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW516_230606	0089_MW249_230606	----	----	----
				Sampling date / time	06-Jun-2023 14:13	06-Jun-2023 14:58	----	----	----
Compound	CAS Number	LOR	Unit		EP2307433-011	EP2307433-012	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**9.61**	**0.24**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**9.29**	**0.24**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**9.47**	**0.24**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.5**	**88.6**	----	----	----
13C8-PFOA	----	0.02	%		**99.5**	**106**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307433**	Page	: 1 of 16
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Jun-2023
C-O-C number	: 53208	Issue Date	: 19-Jun-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5105215)									
EP2307415-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	371	370	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	371	370	0.0	0% - 20%
EP2307433-002	0089_MW256_230606	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	525	524	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	525	524	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5105832)									
EP2307433-012	0089_MW249_230606	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	439	440	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	439	440	0.3	0% - 20%
EP2307450-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	168	158	6.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	168	158	6.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5104216)									
EP2307415-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	58	57	0.0	0% - 20%
EP2307433-001	0089_MW255_230606	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	37	36	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5104220)									
EP2307433-012	0089_MW249_230606	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	59	59	0.0	0% - 20%
EP2307493-012	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2780	2760	1.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 5104217)									
EP2307415-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	340	339	0.0	0% - 20%
EP2307433-001	0089_MW255_230606	ED045G: Chloride	16887-00-6	1	mg/L	61	61	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5104221)									
EP2307433-012	0089_MW249_230606	ED045G: Chloride	16887-00-6	1	mg/L	155	155	0.0	0% - 20%
EP2307493-012	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19600	19700	0.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5105903)									
EP2307415-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	89	89	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	42	42	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	234	234	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	10	10	0.0	0% - 50%
EP2307433-001	0089_MW255_230606	ED093F: Calcium	7440-70-2	1	mg/L	83	84	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	11	11	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	50	50	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5105904)									
EP2307433-012	0089_MW249_230606	ED093F: Calcium	7440-70-2	1	mg/L	94	94	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	38	38	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	116	114	1.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	8	8	0.0	No Limit
EP2307463-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	101	99	2.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	17	16	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	36	35	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107825)									
EP2307433-002	0089_MW256_230606	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	8.00	8.84	9.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	11.2	12.0	7.2	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.77	0.79	3.0	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.76	0.77	0.0	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.35	0.38	8.7	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107826)									
EP2307463-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	6.47	6.20	4.2	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	5.07	5.48	7.7	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.22	0.21	6.8	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.87	0.82	5.7	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2307463-011	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	5.05	5.06	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.07	1.12	5.2	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107826) - continued									
EP2307463-011	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.17	1.11	5.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.67	0.65	2.8	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.65	0.68	5.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107825)									
EP2307433-002	0089_MW256_230606	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.67	0.58	14.4	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.45	0.49	7.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.73	1.78	3.3	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.19	0.21	9.5	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.3	0.4	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107826)									
EP2307463-005	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.60	0.61	2.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.32	0.31	0.0	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.76	0.73	3.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.17	0.16	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.2	0.1	0.0	No Limit
EP2307463-011	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.30	0.33	8.1	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.50	0.48	4.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.85	1.77	4.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.15	0.15	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107826) - continued									
EP2307463-011	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.6	0.6	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107825)									
EP2307433-002	0089_MW256_230606	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	0.08	0.08	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107826)									
EP2307463-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107826) - continued									
EP2307463-005	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2307463-011	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107825)									
EP2307433-002	0089_MW256_230606	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.13	0.14	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107825) - continued									
EP2307433-002	0089_MW256_230606	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107826)									
EP2307463-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2307463-011	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107825)									
EP2307433-002	0089_MW256_230606	EP231X: Sum of PFAS	----	0.01	µg/L	24.6	26.5	7.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	19.2	20.8	8.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	23.4	25.2	7.4	0% - 20%
EP231P: PFAS Sums (QC Lot: 5107826)									
EP2307463-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	14.8	14.7	0.4	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	11.5	11.7	1.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	13.7	13.7	0.0	0% - 20%
EP2307463-011	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	12.0	12.0	0.5	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5107826) - continued									
EP2307463-011	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	6.12	6.18	1.0	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	10.7	10.6	0.7	0% - 20%
EP231P: PFAS Sums (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5105215)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.8	87.8	118
				<1	200 mg/L	97.2	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 5105832)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	118	87.8	118
				<1	200 mg/L	107	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104216)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.2	89.9	112
				<1	500 mg/L	103	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104220)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.3	89.9	112
				<1	500 mg/L	103	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5104217)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	107	88.6	113
				<1	1000 mg/L	95.6	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 5104221)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	107	88.6	113
				<1	1000 mg/L	97.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5105903)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100.0	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.5	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.7	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5105904)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 5105904) - continued								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.9	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.6	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.1	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107825)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	93.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	98.1	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	89.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	98.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107826)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.9	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	92.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	89.5	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	94.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	90.2	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5108595)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	111	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	120	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	97.5	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	123	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	105	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107825)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	92.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.1	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	88.7	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	91.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.2	69.0	133

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107825) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.3	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	97.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107826)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	95.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	94.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	86.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	90.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	93.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	101	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5108595)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	114	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	103	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	113	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107825)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	101	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	94.2	62.2	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107825) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	94.7	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107826)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	88.4	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	93.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	102	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	111	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5108595)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	81.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	119	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.5	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	90.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107825)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	96.0	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	100.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	86.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	93.2	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107826)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	98.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	96.4	67.0	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107826) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	109	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5108595)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	122	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	114	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	113	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	106	64.2	133
EP231P: PFAS Sums (QCLot: 5107825)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5107826)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5108595)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104216)							
EP2307415-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	113	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104220)							
EP2307433-012	0089_MW249_230606	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	114	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5104217)							
EP2307415-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	104	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5104221)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 5104221) - continued							
EP2307433-012	0089_MW249_230606	ED045G: Chloride	16887-00-6	1000 mg/L	106	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107825)							
EP2307433-010	0089_MW496_230606	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	108	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	122	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	97.9	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	95.6	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107826)							
EP2307463-007	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	101	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	124	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	94.2	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107825)							
EP2307433-010	0089_MW496_230606	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	85.6	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	98.7	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	97.5	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	84.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	75.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	93.9	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	102	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	94.3	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	97.5	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	106	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	101	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107826)							
EP2307463-007	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	104	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	97.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	88.2	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.3	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	116	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	95.8	69.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107826) - continued							
EP2307463-007	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	95.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	99.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	110	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107825)							
EP2307433-010	0089_MW496_230606	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	91.0	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	99.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	101	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	97.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	93.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	89.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	96.9	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107826)							
EP2307463-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	93.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	108	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	99.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	102	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107825)							
EP2307433-010	0089_MW496_230606	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	94.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	107	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	89.4	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	91.4	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107826)							
EP2307463-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	102	63.0	143

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107826) - continued							
EP2307463-007	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	103	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	111	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307433**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023
Site	: Stirling GW - CG	Issue Date	: 19-Jun-2023
Sampler	: [redacted]	No. of samples received	: 12
Order number	: pfas-omp/Stirling	No. of samples analysed	: 12

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2307433--010	0089_MW496_230606	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2307463--007	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2307433--010	0089_MW496_230606	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2307463--007	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_MW255_230606,	0089_MW256_230606,	----	----	----	14-Jun-2023	13-Jun-2023	**1**
0089_MW259_230606,	0089_MW236_230606,						
0089_MW257_230606,	0089_MW258_230606,						
0089_MW269_230606,	0089_MW268_230606,						
0089_MW496_230606,	0089_MW516_230606,						
0089_MW249_230606							

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
	4				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	4	47	8.51	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	47	4.26	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW255_230606, 0089_MW256_230606, 0089_MW259_230606, 0089_MW236_230606, 0089_MW257_230606, 0089_MW258_230606, 0089_MW269_230606, 0089_MW268_230606, 0089_MW496_230606, 0089_MW516_230606	**06-Jun-2023**	**----**	----	**----**	**12-Jun-2023**	20-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW249_230606	**06-Jun-2023**	**----**	----	**----**	**13-Jun-2023**	20-Jun-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW255_230606, 0089_MW256_230606, 0089_MW259_230606, 0089_MW236_230606, 0089_MW257_230606, 0089_MW258_230606, 0089_MW269_230606, 0089_MW268_230606, 0089_MW496_230606, 0089_MW516_230606, 0089_MW249_230606	**06-Jun-2023**	**----**	----	**----**	**16-Jun-2023**	04-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW255_230606, 0089_MW256_230606, 0089_MW259_230606, 0089_MW236_230606, 0089_MW257_230606, 0089_MW258_230606, 0089_MW269_230606, 0089_MW268_230606, 0089_MW496_230606, 0089_MW516_230606, 0089_MW249_230606	**06-Jun-2023**	**----**	----	**----**	**16-Jun-2023**	04-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW255_230606, 0089_MW256_230606, 0089_MW259_230606, 0089_MW236_230606, 0089_MW257_230606, 0089_MW258_230606, 0089_MW269_230606, 0089_MW268_230606, 0089_MW496_230606, 0089_MW516_230606, 0089_MW249_230606	**06-Jun-2023**	**----**	----	**----**	**14-Jun-2023**	13-Jun-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW255_230606,	0089_MW256_230606,	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
0089_MW259_230606,	0089_MW236_230606,							
0089_QC102_230606,	0089_MW257_230606,							
0089_MW258_230606,	0089_MW269_230606,							
0089_MW268_230606,	0089_MW496_230606,							
0089_MW516_230606,	0089_MW249_230606							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW255_230606,	0089_MW256_230606,	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
0089_MW259_230606,	0089_MW236_230606,							
0089_QC102_230606,	0089_MW257_230606,							
0089_MW258_230606,	0089_MW269_230606,							
0089_MW268_230606,	0089_MW496_230606,							
0089_MW516_230606,	0089_MW249_230606							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_MW255_230606,	0089_MW256_230606,	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
0089_MW259_230606,	0089_MW236_230606,							
0089_QC102_230606,	0089_MW257_230606,							
0089_MW258_230606,	0089_MW269_230606,							
0089_MW268_230606,	0089_MW496_230606,							
0089_MW516_230606,	0089_MW249_230606							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW255_230606,	0089_MW256_230606,	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
0089_MW259_230606,	0089_MW236_230606,							
0089_QC102_230606,	0089_MW257_230606,							
0089_MW258_230606,	0089_MW269_230606,							
0089_MW268_230606,	0089_MW496_230606,							
0089_MW516_230606,	0089_MW249_230606							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_MW255_230606,	0089_MW256_230606,	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
0089_MW259_230606,	0089_MW236_230606,							
0089_QC102_230606,	0089_MW257_230606,							
0089_MW258_230606,	0089_MW269_230606,							
0089_MW268_230606,	0089_MW496_230606,							
0089_MW516_230606,	0089_MW249_230606							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	47	**8.51**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	47	**6.38**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	47	**6.38**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	47	**4.26**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2307434

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

Phone: ( )

53205 53208 53210 53216

ALS Compass COC Reference: 53215 **# Samples:** **Sampler:**

Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 7/6/23 8:00	Date / Time: 7/6 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 53210 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW319		06/06/2023 12:02 PM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_SW318		06/06/2023 12:03 PM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_SW317		06/06/2023 12:04 PM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_QC105		06/06/2023 12:06 PM	WATER	ALS: 2 Non ALS: 0	No	Partial 1/2		
005	0089_PW374		06/06/2023 12:42 PM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_PW375		06/06/2023 12:45 PM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW378		06/06/2023 12:47 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **53210** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
004	0089_QC105	WA OMP Water Suite WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 53210 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW319	Clear Plastic Bottle - Natural	125 mL	00070522054784	Green	No	
001	0089_SW319	HDPE (no PTFE)	20 mL	00350822082534	Grey	No	
001	0089_SW319	HDPE (no PTFE)	20 mL	00350822082508	Grey	No	
002	0089_SW318	Clear Plastic Bottle - Natural	125 mL	00070522054752	Green	No	
002	0089_SW318	HDPE (no PTFE)	20 mL	00350822082503	Grey	No	
002	0089_SW318	HDPE (no PTFE)	20 mL	00350822082475	Grey	No	
003	0089_SW317	Clear Plastic Bottle - Natural	125 mL	00070522054750	Green	No	
003	0089_SW317	HDPE (no PTFE)	20 mL	00350822082599	Grey	No	
003	0089_SW317	HDPE (no PTFE)	20 mL	00350822082596	Grey	No	
004	0089_QC105	HDPE (no PTFE)	20 mL	00350822082483	Grey	No	
004	0089_QC105	HDPE (no PTFE)	20 mL	00350822082493	Grey	No	
005	0089_PW374	HDPE (no PTFE)	20 mL	00351116054043	Grey	No	
005	0089_PW374	Clear Plastic Bottle - Natural	125 mL	00070522054793	Green	No	
005	0089_PW374	HDPE (no PTFE)	20 mL	00350822082678	Grey	No	
006	0089_PW375	Clear Plastic Bottle - Natural	125 mL	00070522051854	Green	No	
006	0089_PW375	HDPE (no PTFE)	20 mL	00350822082545	Grey	No	
006	0089_PW375	HDPE (no PTFE)	20 mL	00350822082443	Grey	No	
007	0089_PW378	Clear Plastic Bottle - Natural	125 mL	00070522054755	Green	No	
007	0089_PW378	HDPE (no PTFE)	20 mL	00350822082501	Grey	No	
007	0089_PW378	HDPE (no PTFE)	20 mL	00350822082383	Grey	No	

Total Bottle Count: ALS: 20, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307434**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53210	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 07-Jun-2023 12:00	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 16-Jun-2023	Scheduled Reporting Date	: **16-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 11.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307434-001	06-Jun-2023 12:02	0089_SW319_230606	✓	✓
EP2307434-002	06-Jun-2023 12:03	0089_SW318_230606	✓	✓
EP2307434-003	06-Jun-2023 12:04	0089_SW317_230606	✓	✓
EP2307434-004	06-Jun-2023 12:06	0089_QC105_230606	✓	
EP2307434-005	06-Jun-2023 12:42	0089_PW374_230606	✓	✓
EP2307434-006	06-Jun-2023 12:45	0089_PW375_230606	✓	✓
EP2307434-007	06-Jun-2023 12:47	0089_PW378_230606	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307434**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Jun-2023
C-O-C number	: 53210	Issue Date	: 19-Jun-2023 12:45
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits for sample #7 due to analytes not quantified in this report. Major cations (ED093F) and major anions (ED041G/ED045G) have been confirmed by re-analysis.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW319_230606	0089_SW318_230606	0089_SW317_230606	0089_QC105_230606	0089_PW374_230606
				Sampling date / time	06-Jun-2023 12:02	06-Jun-2023 12:03	06-Jun-2023 12:04	06-Jun-2023 12:06	06-Jun-2023 12:42
Compound	CAS Number	LOR	Unit		EP2307434-001	EP2307434-002	EP2307434-003	EP2307434-004	EP2307434-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**122**	**127**	**118**	----	**125**
Total Alkalinity as CaCO3	----	1	mg/L		**122**	**127**	**118**	----	**125**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2890**	**2600**	**2860**	----	**2860**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20400**	**20700**	**20500**	----	**20600**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**424**	**444**	**426**	----	**434**
Magnesium	7439-95-4	1	mg/L		**1330**	**1370**	**1340**	----	**1340**
Sodium	7440-23-5	1	mg/L		**13000**	**13500**	**13100**	----	**13200**
Potassium	7440-09-7	1	mg/L		**475**	**493**	**482**	----	**484**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**638**	**640**	**640**	----	**643**
ø Total Cations	----	0.01	meq/L		**708**	**735**	**714**	----	**718**
ø Ionic Balance	----	0.01	%		**5.21**	**6.84**	**5.43**	----	**5.53**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.07**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW319_230606	0089_SW318_230606	0089_SW317_230606	0089_QC105_230606	0089_PW374_230606
				Sampling date / time	06-Jun-2023 12:02	06-Jun-2023 12:03	06-Jun-2023 12:04	06-Jun-2023 12:06	06-Jun-2023 12:42
Compound	CAS Number	LOR	Unit		EP2307434-001	EP2307434-002	EP2307434-003	EP2307434-004	EP2307434-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW319_230606	0089_SW318_230606	0089_SW317_230606	0089_QC105_230606	0089_PW374_230606
				Sampling date / time	06-Jun-2023 12:02	06-Jun-2023 12:03	06-Jun-2023 12:04	06-Jun-2023 12:06	06-Jun-2023 12:42
Compound	CAS Number	LOR	Unit		EP2307434-001	EP2307434-002	EP2307434-003	EP2307434-004	EP2307434-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.07**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.07**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.07**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**87.3**	**94.2**	**107**	**97.9**
13C8-PFOA	----	0.02	%		**103**	**104**	**104**	**92.0**	**102**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW375_230606	0089_PW378_230606	----	----	----
				Sampling date / time	06-Jun-2023 12:45	06-Jun-2023 12:47	----	----	----
Compound	CAS Number	LOR	Unit		EP2307434-006	EP2307434-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**123**	**122**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**123**	**122**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2870**	**2800**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20600**	**19300**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**430**	**484**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1330**	**1560**	----	----	----
Sodium	7440-23-5	1	mg/L		**13200**	**13400**	----	----	----
Potassium	7440-09-7	1	mg/L		**485**	**544**	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**643**	**605**	----	----	----
ø **Total Cations**	----	0.01	meq/L		**717**	**749**	----	----	----
ø **Ionic Balance**	----	0.01	%		**5.45**	**10.6**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.65**	**0.02**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW375_230606	0089_PW378_230606	----	----	----
				Sampling date / time	06-Jun-2023 12:45	06-Jun-2023 12:47	----	----	----
Compound	CAS Number	LOR	Unit		EP2307434-006	EP2307434-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW375_230606	0089_PW378_230606	----	----	----
				Sampling date / time	06-Jun-2023 12:45	06-Jun-2023 12:47	----	----	----
Compound	CAS Number	LOR	Unit		EP2307434-006	EP2307434-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.65**	**0.02**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.65**	**0.02**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.65**	**0.02**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**99.5**	----	----	----
13C8-PFOA	----	0.02	%		**104**	**97.5**	----	----	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307434**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Jun-2023
C-O-C number	: 53210	Issue Date	: 19-Jun-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5105832)									
EP2307433-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	439	440	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	439	440	0.3	0% - 20%
EP2307450-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	168	158	6.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	168	158	6.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5104218)									
EP2307434-001	0089_SW319_230606	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2890	2860	1.2	0% - 20%
EP2307463-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	16	16	0.0	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 5104219)									
EP2307434-001	0089_SW319_230606	ED045G: Chloride	16887-00-6	1	mg/L	20400	20500	0.1	0% - 20%
EP2307463-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	41	41	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5105904)									
EP2307433-012	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	94	94	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	38	38	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	116	114	1.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	8	8	0.0	No Limit
EP2307463-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	101	99	2.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	17	16	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	36	35	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107826)									
EP2307463-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	6.47	6.20	4.2	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	5.07	5.48	7.7	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.22	0.21	6.8	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.87	0.82	5.7	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2307463-011	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	5.05	5.06	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.07	1.12	5.2	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.17	1.11	5.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.67	0.65	2.8	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.65	0.68	5.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107826)									
EP2307463-005	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.60	0.61	2.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.32	0.31	0.0	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.76	0.73	3.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.17	0.16	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.2	0.1	0.0	No Limit
EP2307463-011	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.30	0.33	8.1	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.50	0.48	4.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.85	1.77	4.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.15	0.15	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107826) - continued									
EP2307463-011	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.6	0.6	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107826)									
EP2307463-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2307463-011	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107826)									
EP2307463-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2307463-011	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107826)									
EP2307463-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	14.8	14.7	0.4	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5107826) - continued									
EP2307463-005	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	11.5	11.7	1.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	13.7	13.7	0.0	0% - 20%
EP2307463-011	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	12.0	12.0	0.5	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	6.12	6.18	1.0	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	10.7	10.6	0.7	0% - 20%
EP231P: PFAS Sums (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5105832)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	118	87.8	118
				<1	200 mg/L	107	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104218)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.6	89.9	112
				<1	500 mg/L	101	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5104219)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	106	88.6	113
				<1	1000 mg/L	97.1	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5105904)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.9	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.6	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.1	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107826)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.9	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	92.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	89.5	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	94.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	90.2	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5108595)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	111	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	120	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	97.5	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	123	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	105	53.0	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107826)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	95.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	94.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	86.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	90.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	93.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	101	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5108595)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	114	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	103	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	113	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107826)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	88.4	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	93.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	102	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	111	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5108595)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	81.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	119	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.5	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	90.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107826)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	98.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	96.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	109	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5108595)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	122	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	114	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	113	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	106	64.2	133
EP231P: PFAS Sums (QCLot: 5107826)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5108595)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104218)							
EP2307434-001	0089_SW319_230606	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5104219)							
EP2307434-001	0089_SW319_230606	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107826)							
EP2307463-007	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	101	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	124	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	94.2	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107826)							
EP2307463-007	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	104	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	97.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	88.2	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.3	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	116	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	95.8	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	95.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	99.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	110	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107826)							
EP2307463-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	93.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	108	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	99.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	102	65.0	136

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107826) - continued							
EP2307463-007	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107826)							
EP2307463-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	102	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	103	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	111	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307434**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023
Site	: Stirling SW/PW - CG	Issue Date	: 19-Jun-2023
Sampler	: [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2307434--001	0089_SW319_230606	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2307434--001	0089_SW319_230606	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2307463--007	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2307463--007	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_SW319_230606,	0089_SW318_230606,	----	----	----	14-Jun-2023	13-Jun-2023	**1**
0089_SW317_230606,	0089_PW374_230606,						
0089_PW375_230606,	0089_PW378_230606						

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	28	3.57	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW319_230606,	0089_SW318_230606,	**06-Jun-2023**	**----**	----	----	**13-Jun-2023**	20-Jun-2023	✓
0089_SW317_230606,	0089_PW374_230606,							
0089_PW375_230606,	0089_PW378_230606							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW319_230606,	0089_SW318_230606,	**06-Jun-2023**	**----**	----	----	**16-Jun-2023**	04-Jul-2023	✓
0089_SW317_230606,	0089_PW374_230606,							
0089_PW375_230606,	0089_PW378_230606							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW319_230606,	0089_SW318_230606,	**06-Jun-2023**	**----**	----	----	**16-Jun-2023**	04-Jul-2023	✓
0089_SW317_230606,	0089_PW374_230606,							
0089_PW375_230606,	0089_PW378_230606							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_SW319_230606,	0089_SW318_230606,	**06-Jun-2023**	**----**	----	----	**14-Jun-2023**	13-Jun-2023	×
0089_SW317_230606,	0089_PW374_230606,							
0089_PW375_230606,	0089_PW378_230606							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW319_230606,	0089_SW318_230606,	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
0089_SW317_230606,	0089_QC105_230606,							
0089_PW374_230606,	0089_PW375_230606,							
0089_PW378_230606								
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW319_230606,	0089_SW318_230606,	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
0089_SW317_230606,	0089_QC105_230606,							
0089_PW374_230606,	0089_PW375_230606,							
0089_PW378_230606								
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_SW319_230606,	0089_SW318_230606,	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
0089_SW317_230606,	0089_QC105_230606,							
0089_PW374_230606,	0089_PW375_230606,							
0089_PW378_230606								

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW319_230606, 0089_SW318_230606, 0089_SW317_230606, 0089_QC105_230606, 0089_PW374_230606, 0089_PW375_230606, 0089_PW378_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW319_230606, 0089_SW318_230606, 0089_SW317_230606, 0089_QC105_230606, 0089_PW374_230606, 0089_PW375_230606, 0089_PW378_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	28	**10.71**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	28	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	28	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	28	**3.57**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2307435

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

Phone: ( )

ALS Compass COC Reference: 53205 53208 53210 53216 53215 **# Samples:** **Sampler:** [redacted]

Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 7/6/23 8:00	Date / Time: 7/6 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 53216 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD374		06/06/2023 12:39 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD375		06/06/2023 12:40 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD378		06/06/2023 12:40 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_QC107		06/06/2023 12:41 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 53216 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD374	HDPE Soil Jar	200 mL	00621122035164	Grey	No	
002	0089_SD375	HDPE Soil Jar	200 mL	00621122035163	Grey	No	
003	0089_SD378	HDPE Soil Jar	200 mL	00621122035188	Grey	No	
004	0089_QC107	HDPE Soil Jar	200 mL	00621122035215	Grey	No	

Total Bottle Count: ALS: 4, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307435**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53216	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 07-Jun-2023 12:00	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 16-Jun-2023	Scheduled Reporting Date	: **16-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 11.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2307435-001	06-Jun-2023 12:39	0089_SD374_230606	✓	✓
EP2307435-002	06-Jun-2023 12:40	0089_SD375_230606	✓	✓
EP2307435-003	06-Jun-2023 12:40	0089_SD378_230606	✓	✓
EP2307435-004	06-Jun-2023 12:41	0089_QC107_230606	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307435**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53216	Issue Date	: 16-Jun-2023 14:50
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X: Variable matrix spike recovery due to possible matrix interference / sample heterogeneity. Confirmed by visual inspection and re-analysis of extracts.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD374_230606	0089_SD375_230606	0089_SD378_230606	0089_QC107_230606	----
				Sampling date / time	06-Jun-2023 12:39	06-Jun-2023 12:40	06-Jun-2023 12:40	06-Jun-2023 12:41	----
Compound	CAS Number	LOR	Unit		EP2307435-001	EP2307435-002	EP2307435-003	EP2307435-004	--------
					Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**13.3**	**18.3**	**26.2**	**21.3**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0003**	**0.0030**	**0.0002**	**0.0005**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**----**
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD374_230606	0089_SD375_230606	0089_SD378_230606	0089_QC107_230606	----
			Sampling date / time	06-Jun-2023 12:39	06-Jun-2023 12:40	06-Jun-2023 12:40	06-Jun-2023 12:41	----
Compound	CAS Number	LOR	Unit	EP2307435-001	EP2307435-002	EP2307435-003	EP2307435-004	--------
				Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.0003**	**0.0030**	**0.0002**	**0.0005**	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.0003**	**0.0030**	**0.0002**	**0.0005**	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.0003**	**0.0030**	**0.0002**	**0.0005**	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**114**	**99.5**	**95.0**	**91.0**	----
13C8-PFOA	----	0.0002	%	**100**	**108**	**95.5**	**99.5**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2307435**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53216	Issue Date	: 16-Jun-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5105952)									
EP2307435-001	0089_SD374_230606	EA055: Moisture Content	----	0.1	%	13.3	13.5	1.6	0% - 20%
EP2307637-009	Anonymous	EA055: Moisture Content	----	0.1	%	6.4	6.4	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107136)									
EP2307435-001	0089_SD374_230606	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0004	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2307495-007	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107136)									
EP2307435-001	0089_SD374_230606	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107136) - continued									
EP2307435-001	0089_SD374_230606	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2307495-007	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107136)									
EP2307435-001	0089_SD374_230606	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307495-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107136)									
EP2307435-001	0089_SD374_230606	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307495-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107136)									
EP2307435-001	0089_SD374_230606	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
EP2307495-007	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107136)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	113	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	94.1	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	97.9	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	101	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	77.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107136)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	104	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	67.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	103	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107136)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.1	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.6	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	126	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	139	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107136)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107136) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	106	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	119	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	118	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	69.6	54.8	124
EP231P: PFAS Sums (QCLot: 5107136)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107136)							
EP2307435-002	0089_SD375_230606	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	113	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	112	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	96.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	90.3	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# 33.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107136)							
EP2307435-002	0089_SD375_230606	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	113	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	102	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	102	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	97.7	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	103	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	98.3	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	106	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	102	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	97.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	107	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	92.7	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107136)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107136) - continued							
EP2307435-002	0089_SD375_230606	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	104	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	100	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	106	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	102	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	98.5	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	91.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	# 148	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107136)							
EP2307435-002	0089_SD375_230606	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	115	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	123	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	119	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	119	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307435**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023
Site	: Stirling SD - CG	Issue Date	: 16-Jun-2023
Sampler	: [redacted]	No. of samples received	: 4
Order number	: pfas-omp/Stirling	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2307435--002	0089_SD375_230606	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	33.2 %	68.0-136%	**Recovery less than lower data quality objective**
EP231C: Perfluoroalkyl Sulfonamides	EP2307435--002	0089_SD375_230606	**N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)**	2991-50-6	148 %	61.0-139%	**Recovery greater than upper data quality objective**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055) 0089_SD374_230606, 0089_SD375_230606, 0089_SD378_230606, 0089_QC107_230606	**06-Jun-2023**	**----**	----	----	**13-Jun-2023**	20-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) 0089_SD374_230606, 0089_SD375_230606, 0089_SD378_230606, 0089_QC107_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) 0089_SD374_230606, 0089_SD375_230606, 0089_SD378_230606, 0089_QC107_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) 0089_SD374_230606, 0089_SD375_230606, 0089_SD378_230606, 0089_QC107_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) 0089_SD374_230606, 0089_SD375_230606, 0089_SD378_230606, 0089_QC107_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD374_230606, 0089_SD375_230606, 0089_SD378_230606, 0089_QC107_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2307463

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

Phone: ( )

53205 53208 53210 53216

ALS Compass COC Reference: 53215 **# Samples:** **Sampler:**

Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 7/6/23 8:00	Date / Time: 7/6 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 53205 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW112		06/06/2023 11:42 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_QC104		06/06/2023 11:43 AM	WATER	ALS: 2 Non ALS: 0	No	X			
003	0089_MW123		06/06/2023 11:45 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_QC101		06/06/2023 11:45 AM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_MW121		06/06/2023 11:46 AM	WATER	ALS: 5 Non ALS: 0	No		X		extra PFAS bottles for lab QC
006	0089_MW120		06/06/2023 11:47 AM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0089_QC103		06/06/2023 11:48 AM	WATER	ALS: 4 Non ALS: 0	No	X			extra PFAS bottles for lab QC
008	0089_MW500		06/06/2023 12:18 PM	WATER	ALS: 3 Non ALS: 0	No		X		
009	0089_MW109		06/06/2023 12:29 PM	WATER	ALS: 3 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: 53205 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW172		06/06/2023 02:27 PM	WATER	ALS: 3 Non ALS: 0	No		X		
011	0089_MW171		06/06/2023 02:29 PM	WATER	ALS: 5 Non ALS: 0	No		X		extra PFAS bottles for lab QC
012	0089_MW166		06/06/2023 02:31 PM	WATER	ALS: 3 Non ALS: 0	No		X		
013	0089_MW161		06/06/2023 02:32 PM	WATER	ALS: 3 Non ALS: 0	No		X		
014	0089_MW158		06/06/2023 02:33 PM	WATER	ALS: 3 Non ALS: 0	No		X		
015	0089_MW196		06/06/2023 02:48 PM	WATER	ALS: 3 Non ALS: 0	No		X		
016	0089_MW242		06/06/2023 03:12 PM	WATER	ALS: 3 Non ALS: 0	No		X		
017	0089_QC301		06/06/2023 03:32 PM	WATER	ALS: 2 Non ALS: 0	No	X			
018	0089_QC302		06/06/2023 03:33 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: 53205 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0089_QC303		06/06/2023 03:34 PM	WATER	ALS: 2 Non ALS: 0	No	X			
020	0089_QC401		06/06/2023 03:41 PM	WATER	ALS: 0 Non ALS: 2	No	X			
021	0089_QC402		06/06/2023 03:42 PM	WATER	ALS: 0 Non ALS: 2	No	X			
022	0089_QC403		06/06/2023 03:42 PM	WATER	ALS: 0 Non ALS: 2	No	X			
23	QC109				2		X			

CHAIN OF CUSTODY

COC#: 53205 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW112	Clear Plastic Bottle - Natural	125 mL	00070522054774	Green	No	
001	0089_MW112	HDPE (no PTFE)	20 mL	00350822082882	Grey	No	
001	0089_MW112	HDPE (no PTFE)	20 mL	00350822082793	Grey	No	
002	0089_QC104	HDPE (no PTFE)	20 mL	00350822083317	Grey	No	
002	0089_QC104	HDPE (no PTFE)	20 mL	00350822083314	Grey	No	
003	0089_MW123	HDPE (no PTFE)	20 mL	00350822082418	Grey	No	
003	0089_MW123	Clear Plastic Bottle - Natural	125 mL	00070522054830	Green	No	
003	0089_MW123	HDPE (no PTFE)	20 mL	00350822082310	Grey	No	
004	0089_QC101	HDPE (no PTFE)	20 mL	00350822082438	Grey	No	
004	0089_QC101	Clear Plastic Bottle - Natural	125 mL	00070522054894	Green	No	
004	0089_QC101	HDPE (no PTFE)	20 mL	00350822082319	Grey	No	
005	0089_MW121	HDPE (no PTFE)	20 mL	00350822082840	Grey	No	
005	0089_MW121	HDPE (no PTFE)	20 mL	00350822082530	Grey	No	
005	0089_MW121	HDPE (no PTFE)	20 mL	00350822082380	Grey	No	
005	0089_MW121	HDPE (no PTFE)	20 mL	00350822082691	Grey	No	
005	0089_MW121	Clear Plastic Bottle - Natural	125 mL	00070522067373	Green	No	
005	0089_MW121	Clear Plastic Bottle - Natural	125 mL	00070522067355	Green	No	
006	0089_MW120	HDPE (no PTFE)	20 mL	00350822082908	Grey	No	
006	0089_MW120	HDPE (no PTFE)	20 mL	00350822082730	Grey	No	
006	0089_MW120	HDPE (no PTFE)	20 mL	00350822082329	Grey	No	
007	0089_QC103	HDPE (no PTFE)	20 mL	00350822082359	Grey	No	
007	0089_QC103	HDPE (no PTFE)	20 mL	00350822082826	Grey	No	
007	0089_QC103	HDPE (no PTFE)	20 mL	00350822082895	Grey	No	
007	0089_QC103	HDPE (no PTFE)	20 mL	00350822083467	Grey	No	
008	0089_MW500	HDPE (no PTFE)	20 mL	00350822083322	Grey	No	
008	0089_MW500	Clear Plastic Bottle - Natural	125 mL	00070522054746	Green	No	

CHAIN OF CUSTODY

COC#: 53205 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW109	Clear Plastic Bottle - Natural	125 mL	00070522054845	Green	No	
009	0089_MW109	HDPE (no PTFE)	20 mL	00350822082775	Grey	No	
009	0089_MW109	HDPE (no PTFE)	20 mL	00350822082875	Grey	No	
010	0089_MW172	Clear Plastic Bottle - Natural	125 mL	00070522067327	Green	No	
010	0089_MW172	HDPE (no PTFE)	20 mL	00350822082785	Grey	No	
010	0089_MW172	HDPE (no PTFE)	20 mL	00350822082651	Grey	No	
011	0089_MW171	HDPE (no PTFE)	20 mL	00350822082415	Grey	No	
011	0089_MW171	HDPE (no PTFE)	20 mL	00350822082842	Grey	No	
011	0089_MW171	HDPE (no PTFE)	20 mL	00350822082455	Grey	No	
011	0089_MW171	Clear Plastic Bottle - Natural	125 mL	00070522067311	Green	No	
011	0089_MW171	HDPE (no PTFE)	20 mL	00350822082794	Grey	No	
011	0089_MW171	HDPE (no PTFE)	20 mL	00350822082855	Grey	No	
012	0089_MW166	HDPE (no PTFE)	20 mL	00350822082768	Grey	No	
012	0089_MW166	Clear Plastic Bottle - Natural	125 mL	00070522054782	Green	No	
012	0089_MW166	Clear Plastic Bottle - Natural	125 mL	00070522067328	Green	No	
013	0089_MW161	HDPE (no PTFE)	20 mL	00350822082851	Grey	No	
013	0089_MW161	HDPE (no PTFE)	20 mL	00350822082861	Grey	No	
013	0089_MW161	HDPE (no PTFE)	20 mL	00350822082724	Grey	No	
014	0089_MW158	HDPE (no PTFE)	20 mL	00350822082761	Grey	No	
014	0089_MW158	Clear Plastic Bottle - Natural	125 mL	00070522067381	Green	No	
014	0089_MW158	Clear Plastic Bottle - Natural	125 mL	00070522067365	Green	No	
015	0089_MW196	HDPE (no PTFE)	20 mL	00350822082652	Grey	No	
015	0089_MW196	HDPE (no PTFE)	20 mL	00350822082739	Grey	No	
015	0089_MW196	Clear Plastic Bottle - Natural	125 mL	00070522067340	Green	No	
016	0089_MW242	HDPE (no PTFE)	20 mL	00350822082631	Grey	No	
016	0089_MW242	HDPE (no PTFE)	20 mL	00350822082618	Grey	No	
016	0089_MW242	HDPE (no PTFE)	20 mL	00350821008423	Grey	No	
017	0089_QC301						

CHAIN OF CUSTODY

COC#: 53205 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

017	0089_QC301	HDPE (no PTFE)	20 mL	00350821008350	Grey	No	
018	0089_QC302	HDPE (no PTFE)	20 mL	00350822082496	Grey	No	
018	0089_QC302	HDPE (no PTFE)	20 mL	00350822082360	Grey	No	
019	0089_QC303	HDPE (no PTFE)	20 mL	00350822082384	Grey	No	
019	0089_QC303	HDPE (no PTFE)	20 mL	00350822082403	Grey	No	

Total Bottle Count: ALS: 58, Non ALS: 6

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307463**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53205	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 07-Jun-2023 12:00	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 16-Jun-2023	Scheduled Reporting Date	: **16-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 11.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 23 / 23

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307463-001	06-Jun-2023 11:42	0089_MW112_230606	✓	✓
EP2307463-002	06-Jun-2023 11:43	0089_QC104_230606	✓	
EP2307463-003	06-Jun-2023 11:45	0089_MW123_230606	✓	✓
EP2307463-004	06-Jun-2023 11:45	0089_QC101_230606	✓	✓
EP2307463-005	06-Jun-2023 11:46	0089_MW121_230606	✓	✓
EP2307463-006	06-Jun-2023 11:47	0089_MW120_230606	✓	✓
EP2307463-007	06-Jun-2023 11:48	0089_QC103_230606	✓	
EP2307463-008	06-Jun-2023 12:18	0089_MW500_230606	✓	✓
EP2307463-009	06-Jun-2023 12:29	0089_MW109_230606	✓	✓
EP2307463-010	06-Jun-2023 14:27	0089_MW172_230606	✓	✓
EP2307463-011	06-Jun-2023 14:29	0089_MW171_230606	✓	✓
EP2307463-012	06-Jun-2023 14:31	0089_MW166_230606	✓	✓
EP2307463-013	06-Jun-2023 14:32	0089_MW161_230606	✓	✓
EP2307463-014	06-Jun-2023 14:33	0089_MW158_230606	✓	✓
EP2307463-015	06-Jun-2023 14:48	0089_MW196_230606	✓	✓
EP2307463-016	06-Jun-2023 15:12	0089_MW242_230606	✓	✓
EP2307463-017	06-Jun-2023 15:32	0089_QC301_230606	✓	
EP2307463-018	06-Jun-2023 15:33	0089_QC302_230606	✓	
EP2307463-019	06-Jun-2023 15:34	0089_QC303_230606	✓	
EP2307463-020	06-Jun-2023 15:41	0089_QC401_230606	✓	
EP2307463-021	06-Jun-2023 15:42	0089_QC402_230606	✓	
EP2307463-022	06-Jun-2023 15:42	0089_QC403_230606	✓	
EP2307463-023	[06-Jun-2023]	0089_QC108_230606	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]

DERP LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307463**	Page	: 1 of 21
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Jun-2023
C-O-C number	: 53205	Issue Date	: 19-Jun-2023 13:02
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 23		
No. of samples analysed	: 23		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_230606	0089_QC104_230606	0089_MW123_230606	0089_QC101_230606	0089_MW121_230606
				Sampling date / time	06-Jun-2023 11:42	06-Jun-2023 11:43	06-Jun-2023 11:45	06-Jun-2023 11:45	06-Jun-2023 11:46
Compound	CAS Number	LOR	Unit		EP2307463-001	EP2307463-002	EP2307463-003	EP2307463-004	EP2307463-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		248	----	554	792	274
Total Alkalinity as CaCO3	----	1	mg/L		248	----	554	792	274
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		37	----	16	<1	31
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		41	----	200	457	55
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		81	----	116	119	101
Magnesium	7439-95-4	1	mg/L		11	----	32	77	17
Sodium	7440-23-5	1	mg/L		26	----	157	353	36
Potassium	7440-09-7	1	mg/L		3	----	4	3	3
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		6.88	----	17.0	28.7	7.67
ø Total Cations	----	0.01	meq/L		6.15	----	15.4	27.7	8.08
ø Ionic Balance	----	0.01	%		5.58	----	5.22	1.79	2.60
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.14	0.15	0.25	0.34	0.08
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.55	0.56	0.19	0.30	0.22
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		26.8	29.5	1.64	2.35	6.47
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		6.03	6.57	<0.02	<0.02	0.87
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		21.6	20.7	0.02	0.03	5.07
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		0.1	0.2	<0.1	<0.1	0.2
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.43	0.46	0.04	0.06	0.32
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		2.83	3.20	0.22	0.34	0.76

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_230606	0089_QC104_230606	0089_MW123_230606	0089_QC101_230606	0089_MW121_230606
				Sampling date / time	06-Jun-2023 11:42	06-Jun-2023 11:43	06-Jun-2023 11:45	06-Jun-2023 11:45	06-Jun-2023 11:46
Compound	CAS Number	LOR	Unit		EP2307463-001	EP2307463-002	EP2307463-003	EP2307463-004	EP2307463-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.56**	**0.60**	<0.02	**0.03**	**0.17**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**4.38**	**5.20**	<0.01	<0.01	**0.60**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		**0.11**	**0.10**	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.29**	**0.33**	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_230606	0089_QC104_230606	0089_MW123_230606	0089_QC101_230606	0089_MW121_230606
				Sampling date / time	06-Jun-2023 11:42	06-Jun-2023 11:43	06-Jun-2023 11:45	06-Jun-2023 11:45	06-Jun-2023 11:46
Compound	CAS Number	LOR	Unit		EP2307463-001	EP2307463-002	EP2307463-003	EP2307463-004	EP2307463-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**63.8**	**67.6**	**2.36**	**3.45**	**14.8**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**48.4**	**50.2**	**1.66**	**2.38**	**11.5**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**57.1**	**60.3**	**2.17**	**3.15**	**13.7**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**116**	**91.2**	**94.0**	**95.4**	**98.6**
13C8-PFOA	----	0.02	%		**105**	**114**	**100**	**103**	**99.3**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW120_230606	0089_QC103_230606	0089_MW500_230606	0089_MW109_230606	0089_MW172_230606
				Sampling date / time	06-Jun-2023 11:47	06-Jun-2023 11:48	06-Jun-2023 12:18	06-Jun-2023 12:29	06-Jun-2023 14:27
Compound	CAS Number	LOR	Unit		EP2307463-006	EP2307463-007	EP2307463-008	EP2307463-009	EP2307463-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**247**	----	**450**	**411**	**442**
Total Alkalinity as CaCO3	----	1	mg/L		**247**	----	**450**	**411**	**442**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**16**	----	**37**	**22**	**247**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**41**	----	**52**	**136**	**1200**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**68**	----	**149**	**104**	**96**
Magnesium	7439-95-4	1	mg/L		**16**	----	**14**	**25**	**123**
Sodium	7440-23-5	1	mg/L		**30**	----	**27**	**92**	**890**
Potassium	7440-09-7	1	mg/L		**3**	----	**3**	<1	**47**
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**6.42**	----	**11.2**	**12.5**	**47.8**
ø **Total Cations**	----	0.01	meq/L		**6.09**	----	**9.84**	**11.2**	**54.8**
ø **Ionic Balance**	----	0.01	%		**2.66**	----	**6.60**	**5.29**	**6.82**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.02**	<0.02	**0.22**	**0.13**	**1.32**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.05**	**0.05**	**0.30**	**0.23**	**0.94**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.98**	**2.33**	**6.80**	**1.73**	**8.23**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.31**	**0.45**	**1.51**	**0.03**	**1.68**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**3.09**	**2.29**	**31.3**	**0.40**	**7.52**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	**0.2**	**0.1**	**0.5**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.04**	**0.02**	**0.33**	**0.02**	**0.53**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.16**	**0.13**	**0.86**	**0.24**	**2.48**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW120_230606	0089_QC103_230606	0089_MW500_230606	0089_MW109_230606	0089_MW172_230606
				Sampling date / time	06-Jun-2023 11:47	06-Jun-2023 11:48	06-Jun-2023 12:18	06-Jun-2023 12:29	06-Jun-2023 14:27
Compound	CAS Number	LOR	Unit		EP2307463-006	EP2307463-007	EP2307463-008	EP2307463-009	EP2307463-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.15**	<0.02	**0.21**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.17**	**0.24**	**0.51**	**0.04**	**0.60**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW120_230606	0089_QC103_230606	0089_MW500_230606	0089_MW109_230606	0089_MW172_230606
				Sampling date / time	06-Jun-2023 11:47	06-Jun-2023 11:48	06-Jun-2023 12:18	06-Jun-2023 12:29	06-Jun-2023 14:27
Compound	CAS Number	LOR	Unit		EP2307463-006	EP2307463-007	EP2307463-008	EP2307463-009	EP2307463-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**5.82**	**5.51**	**42.2**	**2.92**	**24.0**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**5.07**	**4.62**	**38.1**	**2.13**	**15.8**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**5.46**	**5.01**	**40.4**	**2.66**	**21.4**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.6**	**94.7**	**86.0**	**105**	**74.2**
13C8-PFOA	----	0.02	%		**104**	**101**	**104**	**102**	**104**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW171_230606	0089_MW166_230606	0089_MW161_230606	0089_MW158_230606	0089_MW196_230606
				Sampling date / time	06-Jun-2023 14:29	06-Jun-2023 14:31	06-Jun-2023 14:32	06-Jun-2023 14:33	06-Jun-2023 14:48
Compound	CAS Number	LOR	Unit		EP2307463-011	EP2307463-012	EP2307463-013	EP2307463-014	EP2307463-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		512	370	376	455	214
Total Alkalinity as CaCO3	----	1	mg/L		512	370	376	455	214
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		315	158	224	530	19
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1980	848	726	4600	36
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		110	100	81	202	55
Magnesium	7439-95-4	1	mg/L		188	84	53	347	14
Sodium	7440-23-5	1	mg/L		1340	586	592	2720	24
Potassium	7440-09-7	1	mg/L		57	35	35	108	2
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		72.6	34.6	32.6	150	5.69
ø Total Cations	----	0.01	meq/L		80.7	38.3	35.0	160	4.99
ø Ionic Balance	----	0.01	%		5.26	5.06	3.54	3.17	6.51
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		1.17	0.05	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.67	0.04	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		5.05	0.69	0.08	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.65	0.11	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		1.07	4.09	2.38	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		0.6	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.50	0.25	0.06	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		1.85	0.24	0.05	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW171_230606	0089_MW166_230606	0089_MW161_230606	0089_MW158_230606	0089_MW196_230606
				Sampling date / time	06-Jun-2023 14:29	06-Jun-2023 14:31	06-Jun-2023 14:32	06-Jun-2023 14:33	06-Jun-2023 14:48
Compound	CAS Number	LOR	Unit		EP2307463-011	EP2307463-012	EP2307463-013	EP2307463-014	EP2307463-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.15**	**0.15**	**0.03**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.30**	**0.07**	**0.01**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.02**	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW171_230606	0089_MW166_230606	0089_MW161_230606	0089_MW158_230606	0089_MW196_230606
				Sampling date / time	06-Jun-2023 14:29	06-Jun-2023 14:31	06-Jun-2023 14:32	06-Jun-2023 14:33	06-Jun-2023 14:48
Compound	CAS Number	LOR	Unit		EP2307463-011	EP2307463-012	EP2307463-013	EP2307463-014	EP2307463-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**12.0**	**5.71**	**2.61**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**6.12**	**4.78**	**2.46**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**10.7**	**5.54**	**2.61**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**100**	**108**	**106**	**101**
13C8-PFOA	----	0.02	%		**102**	**99.9**	**102**	**106**	**106**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW242_230606	----	----	----	----
				Sampling date / time	06-Jun-2023 15:12	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2307463-016	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**184**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**184**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**19**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**14**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**54**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**11**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**10**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**1**	----	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**4.47**	----	----	----	----
ø **Total Cations**	----	0.01	meq/L		**4.06**	----	----	----	----
ø **Ionic Balance**	----	0.01	%		**4.76**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.01**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW242_230606	----	----	----	----
				Sampling date / time	06-Jun-2023 15:12	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2307463-016	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW242_230606	----	----	----	----
				Sampling date / time	06-Jun-2023 15:12	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2307463-016	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.01**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	----	----	----	----
13C8-PFOA	----	0.02	%		**97.7**	----	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_230606	0089_QC302_230606	0089_QC303_230606	0089_QC401_230606	0089_QC402_230606
				Sampling date / time	06-Jun-2023 15:32	06-Jun-2023 15:33	06-Jun-2023 15:34	06-Jun-2023 15:41	06-Jun-2023 15:42
Compound	CAS Number	LOR	Unit		EP2307463-017	EP2307463-018	EP2307463-019	EP2307463-020	EP2307463-021
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_230606	0089_QC302_230606	0089_QC303_230606	0089_QC401_230606	0089_QC402_230606
				Sampling date / time	06-Jun-2023 15:32	06-Jun-2023 15:33	06-Jun-2023 15:34	06-Jun-2023 15:41	06-Jun-2023 15:42
Compound	CAS Number	LOR	Unit		EP2307463-017	EP2307463-018	EP2307463-019	EP2307463-020	EP2307463-021
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**91.3**	**100**	**97.7**	**101**	**98.6**
13C8-PFOA	----	0.02	%		**102**	**98.3**	**101**	**102**	**99.6**

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_230606	----	----	----	----
				Sampling date / time	06-Jun-2023 15:42	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2307463-022	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_230606	----	----	----	----
				Sampling date / time	06-Jun-2023 15:42	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2307463-022	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	----	----	----	----
13C8-PFOA	----	0.02	%		**103**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC108_230606	----	----	----	----
				Sampling date / time	[06-Jun-2023]	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2307463-023	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.12**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC108_230606	----	----	----	----
				Sampling date / time	[06-Jun-2023]	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2307463-023	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.12**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.12**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.12**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.2**	----	----	----	----
13C8-PFOA	----	0.02	%		**105**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: RINSATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307463**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Jun-2023
C-O-C number	: 53205	Issue Date	: 19-Jun-2023
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 23		
No. of samples analysed	: 23		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5105836)									
EP2307452-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	183	197	7.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	183	197	7.2	0% - 20%
EP2307451-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	279	294	5.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	279	294	5.1	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5105840)									
EP2307472-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	74	76	2.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	74	76	2.7	0% - 20%
EP2307464-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	299	297	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	299	297	0.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5104218)									
EP2307434-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2890	2860	1.2	0% - 20%
EP2307463-006	0089_MW120_230606	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	16	16	0.0	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 5104219)									
EP2307434-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	20400	20500	0.1	0% - 20%
EP2307463-006	0089_MW120_230606	ED045G: Chloride	16887-00-6	1	mg/L	41	41	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5105904)									
EP2307433-012	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	94	94	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	38	38	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	116	114	1.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	8	8	0.0	No Limit
EP2307463-005	0089_MW121_230606	ED093F: Calcium	7440-70-2	1	mg/L	101	99	2.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	17	16	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	36	35	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5105905)									
EP2307463-016	0089_MW242_230606	ED093F: Calcium	7440-70-2	1	mg/L	54	55	1.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	11	11	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	10	10	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107826)									
EP2307463-005	0089_MW121_230606	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	6.47	6.20	4.2	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	5.07	5.48	7.7	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.22	0.21	6.8	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.87	0.82	5.7	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2307463-011	0089_MW171_230606	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	5.05	5.06	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.07	1.12	5.2	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.17	1.11	5.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.67	0.65	2.8	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.65	0.68	5.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107827)									
EP2307493-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5108595) - continued									
EP2307493-014	Anonymous	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107826)									
EP2307463-005	0089_MW121_230606	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.60	0.61	2.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.32	0.31	0.0	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.76	0.73	3.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.17	0.16	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.2	0.1	0.0	No Limit
EP2307463-011	0089_MW171_230606	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.30	0.33	8.1	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.50	0.48	4.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.85	1.77	4.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.15	0.15	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.6	0.6	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107827)									
EP2307493-005	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5108595) - continued									
EP2307493-014	Anonymous	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107826)									
EP2307463-005	0089_MW121_230606	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2307463-011	0089_MW171_230606	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107827)									
EP2307493-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107827) - continued									
EP2307493-005	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107826)									
EP2307463-005	0089_MW121_230606	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2307463-011	0089_MW171_230606	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107827)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107827) - continued									
EP2307493-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107826)									
EP2307463-005	0089_MW121_230606	EP231X: Sum of PFAS	----	0.01	µg/L	14.8	14.7	0.4	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	11.5	11.7	1.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	13.7	13.7	0.0	0% - 20%
EP2307463-011	0089_MW171_230606	EP231X: Sum of PFAS	----	0.01	µg/L	12.0	12.0	0.5	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	6.12	6.18	1.0	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	10.7	10.6	0.7	0% - 20%
EP231P: PFAS Sums (QC Lot: 5107827)									
EP2307493-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.02	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5105836)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	116	87.8	118
				<1	200 mg/L	107	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 5105840)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	114	87.8	118
				<1	200 mg/L	106	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104218)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.6	89.9	112
				<1	500 mg/L	101	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5104219)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	106	88.6	113
				<1	1000 mg/L	97.1	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5105904)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.9	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.6	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.1	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5105905)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.9	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.5	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107826)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.9	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107826) - continued								
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	92.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	89.5	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	94.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	90.2	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107827)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	91.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	87.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	82.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	79.9	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5108595)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	111	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	120	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	97.5	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	123	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	105	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107826)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	95.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	94.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	86.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	90.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	93.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	101	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107827)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	102	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	96.2	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107827) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	98.0	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	78.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	100	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	103	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5108595)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	114	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	103	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	113	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107826)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	88.4	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	93.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	102	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	111	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107827)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	84.2	67.0	137

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107827) - continued								
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	90.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	87.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	90.4	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	111	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5108595)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	81.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	119	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.5	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	90.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107826)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	98.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	96.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	109	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107827)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	115	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	119	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	90.7	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5108595)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	122	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	114	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	113	67.0	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5108595) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	106	64.2	133
EP231P: PFAS Sums (QCLot: 5107826)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5107827)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5108595)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104218)							
EP2307434-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5104219)							
EP2307434-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107826)							
EP2307463-007	0089_QC103_230606	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	101	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	124	69.0	134

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107826) - continued							
EP2307463-007	0089_QC103_230606	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	94.2	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107826)							
EP2307463-007	0089_QC103_230606	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	104	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	97.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	88.2	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.3	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	116	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	95.8	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	95.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	99.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	110	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107826)							
EP2307463-007	0089_QC103_230606	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	93.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	108	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	99.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	102	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107826)							
EP2307463-007	0089_QC103_230606	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	102	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	103	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	111	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307463**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 07-Jun-2023
Site	: Stirling GW - MB	Issue Date	: 19-Jun-2023
Sampler	: [redacted]	No. of samples received	: 23
Order number	: pfas-omp/Stirling	No. of samples analysed	: 23

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2307434--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2307434--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2307463--007	0089_QC103_230606	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2307463--007	0089_QC103_230606	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_MW112_230606,	0089_MW123_230606,	----	----	----	14-Jun-2023	13-Jun-2023	**1**
0089_QC101_230606,	0089_MW121_230606,						
0089_MW120_230606,	0089_MW500_230606,						
0089_MW109_230606,	0089_MW172_230606,						
0089_MW171_230606,	0089_MW166_230606,						
0089_MW161_230606,	0089_MW158_230606,						
0089_MW196_230606,	0089_MW242_230606						

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
	4				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	4	44	9.09	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	44	2.27	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW112_230606,	0089_MW123_230606,	**06-Jun-2023**	**----**	----	**----**	**13-Jun-2023**	20-Jun-2023	✓
0089_QC101_230606,	0089_MW121_230606,							
0089_MW120_230606,	0089_MW500_230606,							
0089_MW109_230606,	0089_MW172_230606,							
0089_MW171_230606,	0089_MW166_230606,							
0089_MW161_230606,	0089_MW158_230606,							
0089_MW196_230606,	0089_MW242_230606							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW112_230606,	0089_MW123_230606,	**06-Jun-2023**	**----**	----	**----**	**16-Jun-2023**	04-Jul-2023	✓
0089_QC101_230606,	0089_MW121_230606,							
0089_MW120_230606,	0089_MW500_230606,							
0089_MW109_230606,	0089_MW172_230606,							
0089_MW171_230606,	0089_MW166_230606,							
0089_MW161_230606,	0089_MW158_230606,							
0089_MW196_230606,	0089_MW242_230606							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW112_230606,	0089_MW123_230606,	**06-Jun-2023**	**----**	----	**----**	**16-Jun-2023**	04-Jul-2023	✓
0089_QC101_230606,	0089_MW121_230606,							
0089_MW120_230606,	0089_MW500_230606,							
0089_MW109_230606,	0089_MW172_230606,							
0089_MW171_230606,	0089_MW166_230606,							
0089_MW161_230606,	0089_MW158_230606,							
0089_MW196_230606,	0089_MW242_230606							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW112_230606, 0089_MW123_230606, 0089_QC101_230606, 0089_MW121_230606, 0089_MW120_230606, 0089_MW500_230606, 0089_MW109_230606, 0089_MW172_230606, 0089_MW171_230606, 0089_MW166_230606, 0089_MW161_230606, 0089_MW158_230606, 0089_MW196_230606, 0089_MW242_230606	**06-Jun-2023**	**----**	----	**----**	**14-Jun-2023**	13-Jun-2023	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW112_230606, 0089_MW123_230606, 0089_MW121_230606, 0089_QC103_230606, 0089_MW109_230606, 0089_MW171_230606, 0089_QC104_230606, 0089_QC101_230606, 0089_MW120_230606, 0089_MW500_230606, 0089_MW172_230606, 0089_QC108_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW166_230606, 0089_MW158_230606, 0089_MW242_230606, 0089_QC302_230606, 0089_QC401_230606, 0089_QC403_230606, 0089_MW161_230606, 0089_MW196_230606, 0089_QC301_230606, 0089_QC303_230606, 0089_QC402_230606,	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**16-Jun-2023**	03-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW112_230606, 0089_MW123_230606, 0089_MW121_230606, 0089_QC103_230606, 0089_MW109_230606, 0089_MW171_230606, 0089_QC104_230606, 0089_QC101_230606, 0089_MW120_230606, 0089_MW500_230606, 0089_MW172_230606, 0089_QC108_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW166_230606, 0089_MW158_230606, 0089_MW242_230606, 0089_QC302_230606, 0089_QC401_230606, 0089_QC403_230606, 0089_MW161_230606, 0089_MW196_230606, 0089_QC301_230606, 0089_QC303_230606, 0089_QC402_230606,	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**16-Jun-2023**	03-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0089_MW112_230606, 0089_QC104_230606, 0089_MW123_230606, 0089_QC101_230606, 0089_MW121_230606, 0089_MW120_230606, 0089_QC103_230606, 0089_MW500_230606, 0089_MW109_230606, 0089_MW172_230606, 0089_MW171_230606, 0089_QC108_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0089_MW166_230606, 0089_MW161_230606, 0089_MW158_230606, 0089_MW196_230606, 0089_MW242_230606, 0089_QC301_230606, 0089_QC302_230606, 0089_QC303_230606, 0089_QC401_230606, 0089_QC402_230606, 0089_QC403_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**16-Jun-2023**	03-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_MW112_230606, 0089_QC104_230606, 0089_MW123_230606, 0089_QC101_230606, 0089_MW121_230606, 0089_MW120_230606, 0089_QC103_230606, 0089_MW500_230606, 0089_MW109_230606, 0089_MW172_230606, 0089_MW171_230606, 0089_QC108_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0089_MW166_230606, 0089_MW161_230606, 0089_MW158_230606, 0089_MW196_230606, 0089_MW242_230606, 0089_QC301_230606, 0089_QC302_230606, 0089_QC303_230606, 0089_QC401_230606, 0089_QC402_230606, 0089_QC403_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**16-Jun-2023**	03-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW112_230606, 0089_MW123_230606, 0089_MW121_230606, 0089_QC103_230606, 0089_MW109_230606, 0089_MW171_230606, 0089_QC104_230606, 0089_QC101_230606, 0089_MW120_230606, 0089_MW500_230606, 0089_MW172_230606, 0089_QC108_230606	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**15-Jun-2023**	03-Dec-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW166_230606, 0089_MW158_230606, 0089_MW242_230606, 0089_QC302_230606, 0089_QC401_230606, 0089_QC403_230606, 0089_MW161_230606, 0089_MW196_230606, 0089_QC301_230606, 0089_QC303_230606, 0089_QC402_230606,	**06-Jun-2023**	**13-Jun-2023**	03-Dec-2023	✓	**16-Jun-2023**	03-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	21	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	44	**9.09**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	44	**2.27**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

(ALS) COC#: 53264 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 8/6 12:40	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW367		07/06/2023 09:46 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_QC111		07/06/2023 09:47 AM	WATER	ALS: 2 Non ALS: 0	No	X			
003	0089_SW370		07/06/2023 09:58 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_QC112		07/06/2023 09:58 AM	WATER	ALS: 2 Non ALS: 0	No	X			
005	0089_PW369		07/06/2023 10:51 AM	WATER	ALS: 5 Non ALS: 0	No		X		extra PFAS bottles for lab QC
006	0089_PW345		07/06/2023 10:52 AM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0089_SW382		07/06/2023 02:19 PM	WATER	ALS: 3 Non ALS: 0	No		X		
008	0089_PW352		07/06/2023 02:20 PM	WATER	ALS: 3 Non ALS: 0	No		X		
009	0089_PW381		07/06/2023 02:21 PM	WATER	ALS: 3 Non ALS: 0	No		X		

Environmental Division Perth

Work Order Reference

EP2307493

Telephone : 61-8-9406 1301

CHAIN OF CUSTODY

ALS COC#: 53264 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_PW351		07/06/2023 02:22 PM	WATER	ALS: 3 Non ALS: 0	No		X		
011	0089_PW350		07/06/2023 02:23 PM	WATER	ALS: 3 Non ALS: 0	No		X		
012	0089_SW353		07/06/2023 02:24 PM	WATER	ALS: 3 Non ALS: 0	No		X		
013	0089_PW380		07/06/2023 02:26 PM	WATER	ALS: 3 Non ALS: 0	No		X		
014	0089_SW384		07/06/2023 02:34 PM	WATER	ALS: 6 Non ALS: 0	No		X		
015	0089_PW401		07/06/2023 02:27 PM	WATER	ALS: 3 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 53264 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW367	HDPE (no PTFE)	20 mL	00350822083363	Grey	No	
001	0089_PW367	HDPE (no PTFE)	20 mL	00350822083417	Grey	No	
001	0089_PW367	Clear Plastic Bottle - Natural	125 mL	00070522054765	Green	No	
002	0089_QC111	HDPE (no PTFE)	20 mL	00350822082331	Grey	No	
002	0089_QC111	HDPE (no PTFE)	20 mL	00350822082435	Grey	No	
003	0089_SW370	HDPE (no PTFE)	20 mL	00350822082808	Grey	No	
003	0089_SW370	HDPE (no PTFE)	20 mL	00350822082643	Grey	No	
003	0089_SW370	Clear Plastic Bottle - Natural	125 mL	00070522067348	Green	No	
004	0089_QC112	HDPE (no PTFE)	20 mL	00350822081499	Grey	No	
004	0089_QC112	HDPE (no PTFE)	20 mL	00350822081496	Grey	No	
005	0089_PW369	Clear Plastic Bottle - Natural	125 mL	00070522054834	Green	No	
005	0089_PW369	HDPE (no PTFE)	20 mL	00350822082521	Grey	No	
005	0089_PW369	HDPE (no PTFE)	20 mL	00350822082413	Grey	No	
005	0089_PW369	HDPE (no PTFE)	20 mL	00350822082723	Grey	No	
005	0089_PW369	HDPE (no PTFE)	20 mL	00350822082629	Grey	No	
006	0089_PW345	HDPE (no PTFE)	20 mL	00350822082838	Grey	No	
006	0089_PW345	Clear Plastic Bottle - Natural	125 mL	00070522054778	Green	No	
006	0089_PW345	HDPE (no PTFE)	20 mL	00350822082868	Grey	No	
007	0089_SW382	HDPE (no PTFE)	20 mL	00350822083214	Grey	No	
007	0089_SW382	HDPE (no PTFE)	20 mL	00350822083236	Grey	No	
007	0089_SW382	Clear Plastic Bottle - Natural	125 mL	00070522054849	Green	No	
008	0089_PW352	Clear Plastic Bottle - Natural	125 mL	00070522054725	Green	No	
008	0089_PW352	HDPE (no PTFE)	20 mL	00350822082805	Grey	No	
008	0089_PW352	HDPE (no PTFE)	20 mL	00350822082817	Grey	No	
009	0089_PW381	Clear Plastic Bottle - Natural	125 mL	00070522054801	Green	No	
009	0089_PW381	HDPE (no PTFE)	20 mL	00350822082726	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 53264 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_PW381	HDPE (no PTFE)	20 mL	00350822082874	Grey	No	
010	0089_PW351	Clear Plastic Bottle - Natural	125 mL	00070522054796	Green	No	
010	0089_PW351	HDPE (no PTFE)	20 mL	00350822082742	Grey	No	
010	0089_PW351	HDPE (no PTFE)	20 mL	00350822082789	Grey	No	
011	0089_PW350	Clear Plastic Bottle - Natural	125 mL	00070522067425	Green	No	
011	0089_PW350	HDPE (no PTFE)	20 mL	00350822082759	Grey	No	
011	0089_PW350	HDPE (no PTFE)	20 mL	00350822082669	Grey	No	
012	0089_SW353	HDPE (no PTFE)	20 mL	00350822082696	Grey	No	
012	0089_SW353	HDPE (no PTFE)	20 mL	00350822082670	Grey	No	
012	0089_SW353	Clear Plastic Bottle - Natural	125 mL	00070522054747	Green	No	
013	0089_PW380	HDPE (no PTFE)	20 mL	00350822082750	Grey	No	
013	0089_PW380	HDPE (no PTFE)	20 mL	00350822082686	Grey	No	
013	0089_PW380	Clear Plastic Bottle - Natural	125 mL	00070522054878	Green	No	
014	0089_SW384	Clear Plastic Bottle - Natural	125 mL	00070522054840	Green	No	
014	0089_SW384	HDPE (no PTFE)	20 mL	00350822082645	Grey	No	
014	0089_SW384	HDPE (no PTFE)	20 mL	00350822082845	Grey	No	
014	0089_SW384	Clear Plastic Bottle - Natural	125 mL	00070522054736	Green	No	
014	0089_SW384	HDPE (no PTFE)	20 mL	00350822082898	Grey	No	
014	0089_SW384	HDPE (no PTFE)	20 mL	00350822082854	Grey	No	
015	0089_PW401	HDPE (no PTFE)	20 mL	00350822082878	Grey	No	
015	0089_PW401	HDPE (no PTFE)	20 mL	00350822082871	Grey	No	
015	0089_PW401	Clear Plastic Bottle - Natural	125 mL	00070522054794	Green	No	

Total Bottle Count: ALS: 48, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307493**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53264	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 12:40	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 16-Jun-2023	Scheduled Reporting Date	: **16-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 15 / 15

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307493-001	07-Jun-2023 09:46	0089_PW367_230607	✓	✓
EP2307493-002	07-Jun-2023 09:47	0089_QC111_230607	✓	
EP2307493-003	07-Jun-2023 09:58	0089_SW370_230607	✓	✓
EP2307493-004	07-Jun-2023 09:58	0089_QC112_230607	✓	
EP2307493-005	07-Jun-2023 10:51	0089_PW369_230607	✓	✓
EP2307493-006	07-Jun-2023 10:52	0089_PW345_230607	✓	✓
EP2307493-007	07-Jun-2023 14:19	0089_SW382_230607	✓	✓
EP2307493-008	07-Jun-2023 14:20	0089_PW352_230607	✓	✓
EP2307493-009	07-Jun-2023 14:21	0089_PW381_230607	✓	✓
EP2307493-010	07-Jun-2023 14:22	0089_PW351_230607	✓	✓
EP2307493-011	07-Jun-2023 14:23	0089_PW350_230607	✓	✓
EP2307493-012	07-Jun-2023 14:24	0089_SW353_230607	✓	✓
EP2307493-013	07-Jun-2023 14:26	0089_PW380_230607	✓	✓
EP2307493-014	07-Jun-2023 14:34	0089_SW384_230607	✓	✓
EP2307493-015	07-Jun-2023 14:27	0089_PW401_230607	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307493**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 12:40
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53264	Issue Date	: 19-Jun-2023 12:47
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW367_230607	0089_QC111_230607	0089_SW370_230607	0089_QC112_230607	0089_PW369_230607
				Sampling date / time	07-Jun-2023 09:46	07-Jun-2023 09:47	07-Jun-2023 09:58	07-Jun-2023 09:58	07-Jun-2023 10:51
Compound	CAS Number	LOR	Unit		EP2307493-001	EP2307493-002	EP2307493-003	EP2307493-004	EP2307493-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	<1	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		408	----	125	----	162
Total Alkalinity as CaCO3	----	1	mg/L		408	----	125	----	162
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		1900	----	2660	----	2460
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		14400	----	19800	----	17600
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		332	----	437	----	388
Magnesium	7439-95-4	1	mg/L		875	----	1300	----	1110
Sodium	7440-23-5	1	mg/L		9000	----	13000	----	11400
Potassium	7440-09-7	1	mg/L		338	----	468	----	415
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		454	----	616	----	551
ø Total Cations	----	0.01	meq/L		489	----	706	----	617
ø Ionic Balance	----	0.01	%		3.69	----	6.79	----	5.67
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.04	0.02	<0.01	<0.01	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW367_230607	0089_QC111_230607	0089_SW370_230607	0089_QC112_230607	0089_PW369_230607
				Sampling date / time	07-Jun-2023 09:46	07-Jun-2023 09:47	07-Jun-2023 09:58	07-Jun-2023 09:58	07-Jun-2023 10:51
Compound	CAS Number	LOR	Unit		EP2307493-001	EP2307493-002	EP2307493-003	EP2307493-004	EP2307493-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW367_230607	0089_QC111_230607	0089_SW370_230607	0089_QC112_230607	0089_PW369_230607
				Sampling date / time	07-Jun-2023 09:46	07-Jun-2023 09:47	07-Jun-2023 09:58	07-Jun-2023 09:58	07-Jun-2023 10:51
Compound	CAS Number	LOR	Unit		EP2307493-001	EP2307493-002	EP2307493-003	EP2307493-004	EP2307493-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.04**	**0.02**	<0.01	<0.01	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.04**	**0.02**	<0.01	<0.01	**0.02**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.04**	**0.02**	<0.01	<0.01	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**99.3**	**99.0**	**105**	**95.9**
13C8-PFOA	----	0.02	%		**104**	**108**	**97.4**	**103**	**104**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW345_230607	0089_SW382_230607	0089_PW352_230607	0089_PW381_230607	0089_PW351_230607
				Sampling date / time	07-Jun-2023 10:52	07-Jun-2023 14:19	07-Jun-2023 14:20	07-Jun-2023 14:21	07-Jun-2023 14:22
Compound	CAS Number	LOR	Unit		EP2307493-006	EP2307493-007	EP2307493-008	EP2307493-009	EP2307493-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		161	117	116	116	117
Total Alkalinity as CaCO3	----	1	mg/L		161	117	116	116	117
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2300	2730	2770	2770	2780
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		16700	19800	19900	19700	19800
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		384	429	422	421	435
Magnesium	7439-95-4	1	mg/L		1100	1240	1230	1230	1260
Sodium	7440-23-5	1	mg/L		11400	12400	12300	12300	12600
Potassium	7440-09-7	1	mg/L		418	456	454	450	462
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		522	618	621	616	619
ø Total Cations	----	0.01	meq/L		616	674	669	669	685
ø Ionic Balance	----	0.01	%		8.26	4.39	3.69	4.13	5.10
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.02	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW345_230607	0089_SW382_230607	0089_PW352_230607	0089_PW381_230607	0089_PW351_230607
				Sampling date / time	07-Jun-2023 10:52	07-Jun-2023 14:19	07-Jun-2023 14:20	07-Jun-2023 14:21	07-Jun-2023 14:22
Compound	CAS Number	LOR	Unit		EP2307493-006	EP2307493-007	EP2307493-008	EP2307493-009	EP2307493-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW345_230607	0089_SW382_230607	0089_PW352_230607	0089_PW381_230607	0089_PW351_230607
				Sampling date / time	07-Jun-2023 10:52	07-Jun-2023 14:19	07-Jun-2023 14:20	07-Jun-2023 14:21	07-Jun-2023 14:22
Compound	CAS Number	LOR	Unit		EP2307493-006	EP2307493-007	EP2307493-008	EP2307493-009	EP2307493-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.8**	**98.3**	**96.2**	**99.6**	**99.1**
13C8-PFOA	----	0.02	%		**103**	**98.3**	**103**	**95.0**	**99.3**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW350_230607	0089_SW353_230607	0089_PW380_230607	0089_SW384_230607	0089_PW401_230607
				Sampling date / time	07-Jun-2023 14:23	07-Jun-2023 14:24	07-Jun-2023 14:26	07-Jun-2023 14:34	07-Jun-2023 14:27
Compound	CAS Number	LOR	Unit		EP2307493-011	EP2307493-012	EP2307493-013	EP2307493-014	EP2307493-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		117	118	118	118	116
Total Alkalinity as CaCO3	----	1	mg/L		117	118	118	118	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2780	2780	2800	2770	2720
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19700	19600	20100	20000	19900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		427	415	419	418	418
Magnesium	7439-95-4	1	mg/L		1240	1170	1240	1220	1190
Sodium	7440-23-5	1	mg/L		12400	12200	12200	12400	12200
Potassium	7440-09-7	1	mg/L		456	452	453	450	450
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		616	613	628	624	620
ø Total Cations	----	0.01	meq/L		674	659	665	672	661
ø Ionic Balance	----	0.01	%		4.53	3.62	2.90	3.70	3.17
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW350_230607	0089_SW353_230607	0089_PW380_230607	0089_SW384_230607	0089_PW401_230607
				Sampling date / time	07-Jun-2023 14:23	07-Jun-2023 14:24	07-Jun-2023 14:26	07-Jun-2023 14:34	07-Jun-2023 14:27
Compound	CAS Number	LOR	Unit		EP2307493-011	EP2307493-012	EP2307493-013	EP2307493-014	EP2307493-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW350_230607	0089_SW353_230607	0089_PW380_230607	0089_SW384_230607	0089_PW401_230607
				Sampling date / time	07-Jun-2023 14:23	07-Jun-2023 14:24	07-Jun-2023 14:26	07-Jun-2023 14:34	07-Jun-2023 14:27
Compound	CAS Number	LOR	Unit		EP2307493-011	EP2307493-012	EP2307493-013	EP2307493-014	EP2307493-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.3**	**96.9**	**97.8**	**107**	**103**
13C8-PFOA	----	0.02	%		**100**	**99.9**	**95.2**	**103**	**96.4**

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307493**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53264	Issue Date	: 19-Jun-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5107360)									
EP2307493-003	0089_SW370_230607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	125	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	125	125	0.0	0% - 20%
EP2307493-013	0089_PW380_230607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	118	118	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	118	118	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5104220)									
EP2307433-012	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	59	59	0.0	0% - 20%
EP2307493-012	0089_SW353_230607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2780	2760	1.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5104221)									
EP2307433-012	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	155	155	0.0	0% - 20%
EP2307493-012	0089_SW353_230607	ED045G: Chloride	16887-00-6	1	mg/L	19600	19700	0.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5105906)									
EP2307493-001	0089_PW367_230607	ED093F: Calcium	7440-70-2	1	mg/L	332	348	4.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	875	900	2.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	9000	9280	3.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	338	349	3.2	0% - 20%
EP2307498-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	436	441	1.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1320	1320	0.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	13100	13100	0.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	477	477	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5105909)									
EP2307493-007	0089_SW382_230607	ED093F: Calcium	7440-70-2	1	mg/L	429	425	0.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1240	1240	0.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12400	12400	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	456	454	0.6	0% - 20%
EP2307500-008	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	434	422	2.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	993	961	3.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	9640	9210	4.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	332	323	3.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107827)									
EP2307493-005	0089_PW369_230607	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5108595)									
EP2307493-014	0089_SW384_230607	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107827)									
EP2307493-005	0089_PW369_230607	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5108595)									
EP2307493-014	0089_SW384_230607	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5108595) - continued									
EP2307493-014	0089_SW384_230607	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107827)									
EP2307493-005	0089_PW369_230607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5108595)									
EP2307493-014	0089_SW384_230607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107827)									
EP2307493-005	0089_PW369_230607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107827) - continued									
EP2307493-005	0089_PW369_230607	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5108595)									
EP2307493-014	0089_SW384_230607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107827)									
EP2307493-005	0089_PW369_230607	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.02	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5108595)									
EP2307493-014	0089_SW384_230607	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5107360)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.4	87.8	118
				<1	200 mg/L	98.3	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104220)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.3	89.9	112
				<1	500 mg/L	103	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5104221)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	107	88.6	113
				<1	1000 mg/L	97.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5105906)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.4	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.7	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5105909)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	88.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.0	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107827)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	91.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	87.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	82.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	79.9	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107836)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.5	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107836) - continued								
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	98.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	90.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	86.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	107	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	111	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5108595)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	111	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	120	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	97.5	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	123	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	105	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107827)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	102	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	96.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	98.0	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	78.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	100	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	103	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107836)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	93.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107836) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	97.6	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5108595)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	114	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	103	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	113	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107827)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	84.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	90.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	87.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	90.4	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	111	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107836)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	87.4	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	85.6	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	91.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	95.8	65.0	136

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107836) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	114	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5108595)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	81.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	119	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.5	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	90.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107827)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	115	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	119	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	90.7	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107836)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	97.5	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	92.1	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	90.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	95.8	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5108595)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	122	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	114	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	113	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	106	64.2	133
EP231P: PFAS Sums (QCLot: 5107827)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5107836)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5107836) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5108595)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104220)							
EP2307433-012	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	114	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5104221)							
EP2307433-012	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	106	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307493**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling SW/PW - MB	Issue Date	: 19-Jun-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 15
Order number	: pfas-omp/Stirling	No. of samples analysed	: 15

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	38	5.26	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	38	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW367_230607, 0089_SW370_230607, 0089_PW369_230607, 0089_PW345_230607, 0089_SW382_230607, 0089_PW352_230607, 0089_PW381_230607, 0089_PW351_230607, 0089_PW350_230607, 0089_SW353_230607, 0089_PW380_230607, 0089_SW384_230607, 0089_PW401_230607	**07-Jun-2023**	**----**	----	**----**	**13-Jun-2023**	21-Jun-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW367_230607, 0089_SW370_230607, 0089_PW369_230607, 0089_PW345_230607, 0089_SW382_230607, 0089_PW352_230607, 0089_PW381_230607, 0089_PW351_230607, 0089_PW350_230607, 0089_SW353_230607, 0089_PW380_230607, 0089_SW384_230607, 0089_PW401_230607	**07-Jun-2023**	**----**	----	**----**	**16-Jun-2023**	05-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW367_230607, 0089_SW370_230607, 0089_PW369_230607, 0089_PW345_230607, 0089_SW382_230607, 0089_PW352_230607, 0089_PW381_230607, 0089_PW351_230607, 0089_PW350_230607, 0089_SW353_230607, 0089_PW380_230607, 0089_SW384_230607, 0089_PW401_230607	**07-Jun-2023**	**----**	----	----	**16-Jun-2023**	05-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW367_230607, 0089_SW370_230607, 0089_PW369_230607, 0089_PW345_230607, 0089_SW382_230607, 0089_PW352_230607, 0089_PW381_230607, 0089_PW351_230607, 0089_PW350_230607, 0089_SW353_230607, 0089_PW380_230607, 0089_SW384_230607, 0089_PW401_230607	**07-Jun-2023**	**----**	----	----	**14-Jun-2023**	14-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW367_230607, 0089_SW370_230607, 0089_QC112_230607, 0089_PW381_230607, 0089_PW351_230607, 0089_PW350_230607, 0089_SW353_230607, 0089_PW380_230607, 0089_SW384_230607, 0089_PW401_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	04-Dec-2023	✓
HDPE (no PTFE) (EP231X)							
0089_QC111_230607, 0089_PW369_230607, 0089_PW345_230607, 0089_SW382_230607, 0089_PW352_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**16-Jun-2023**	04-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW367_230607, 0089_SW370_230607, 0089_QC112_230607, 0089_PW381_230607, 0089_PW351_230607, 0089_PW350_230607, 0089_SW353_230607, 0089_PW380_230607, 0089_SW384_230607, 0089_PW401_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	04-Dec-2023	✓
HDPE (no PTFE) (EP231X)							
0089_QC111_230607, 0089_PW369_230607, 0089_PW345_230607, 0089_SW382_230607, 0089_PW352_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**16-Jun-2023**	04-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0089_PW367_230607, 0089_SW370_230607, 0089_QC112_230607, 0089_PW381_230607, 0089_PW351_230607, 0089_PW350_230607, 0089_SW353_230607, 0089_PW380_230607, 0089_SW384_230607, 0089_PW401_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	04-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0089_QC111_230607, 0089_PW369_230607, 0089_PW345_230607, 0089_SW382_230607, 0089_PW352_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**16-Jun-2023**	04-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_PW367_230607, 0089_SW370_230607, 0089_QC112_230607, 0089_PW381_230607, 0089_PW351_230607, 0089_PW350_230607, 0089_SW353_230607, 0089_PW380_230607, 0089_SW384_230607, 0089_PW401_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	04-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0089_QC111_230607, 0089_PW369_230607, 0089_PW345_230607, 0089_SW382_230607, 0089_PW352_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**16-Jun-2023**	04-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_PW367_230607, 0089_SW370_230607, 0089_QC112_230607, 0089_PW381_230607, 0089_PW351_230607, 0089_PW350_230607, 0089_SW353_230607, 0089_PW380_230607, 0089_SW384_230607, 0089_PW401_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	04-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0089_QC111_230607, 0089_PW369_230607, 0089_PW345_230607, 0089_SW382_230607, 0089_PW352_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**16-Jun-2023**	04-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	38	**7.89**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	38	**7.89**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	38	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: 53265 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 8/6 12:40	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD367		07/06/2023 09:42 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD369		07/06/2023 10:52 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_QC113		07/06/2023 10:53 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD345		07/06/2023 10:53 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD350		07/06/2023 12:16 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD381		07/06/2023 12:17 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD351		07/06/2023 12:17 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
008	0089_SD352		07/06/2023 12:17 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
009	0089_SD401		07/06/2023 12:18 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

Environmental Division
Perth

Work Order Reference
EP2307495

Telephone : +61-8-9406 1301

CHAIN OF CUSTODY

COC#: 53265 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SD380		07/06/2023 12:18 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 53265 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD367	HDPE Soil Jar	200 mL	00621122035157	Grey	No	
002	0089_SD369	HDPE Soil Jar	200 mL	00621122035203	Grey	No	
003	0089_QC113	HDPE Soil Jar	200 mL	00621122035173	Grey	No	
004	0089_SD345	HDPE Soil Jar	200 mL	00621122035191	Grey	No	
005	0089_SD350	HDPE Soil Jar	200 mL	00621122035176	Grey	No	
006	0089_SD381	HDPE Soil Jar	200 mL	00621122035213	Grey	No	
007	0089_SD351	HDPE Soil Jar	200 mL	00621122035135	Grey	No	
008	0089_SD352	HDPE Soil Jar	200 mL	00621122035189	Grey	No	
009	0089_SD401	HDPE Soil Jar	200 mL	00621122035149	Grey	No	
010	0089_SD380	HDPE Soil Jar	200 mL	00621122035174	Grey	No	

Total Bottle Count: ALS: 10, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307495**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53265	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 12:40	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 16-Jun-2023	Scheduled Reporting Date	: **16-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2307495-001	07-Jun-2023 09:42	0089_SD367_230607	✓	✓
EP2307495-002	07-Jun-2023 10:52	0089_SD369_230607	✓	✓
EP2307495-003	07-Jun-2023 10:53	0089_QC113_230607	✓	✓
EP2307495-004	07-Jun-2023 10:53	0089_SD345_230607	✓	✓
EP2307495-005	07-Jun-2023 12:16	0089_SD350_230607	✓	✓
EP2307495-006	07-Jun-2023 12:17	0089_SD381_230607	✓	✓
EP2307495-007	07-Jun-2023 12:17	0089_SD351_230607	✓	✓
EP2307495-008	07-Jun-2023 12:17	0089_SD352_230607	✓	✓
EP2307495-009	07-Jun-2023 12:18	0089_SD401_230607	✓	✓
EP2307495-010	07-Jun-2023 12:18	0089_SD380_230607	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307495**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 12:40
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53265	Issue Date	: 16-Jun-2023 14:52
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X: Variable matrix spike recovery due to possible matrix interference / sample heterogeneity. Confirmed by visual inspection and re-analysis of extracts.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD367_230607	0089_SD369_230607	0089_QC113_230607	0089_SD345_230607	0089_SD350_230607
				Sampling date / time	07-Jun-2023 09:42	07-Jun-2023 10:52	07-Jun-2023 10:53	07-Jun-2023 10:53	07-Jun-2023 12:16
Compound	CAS Number	LOR	Unit		EP2307495-001	EP2307495-002	EP2307495-003	EP2307495-004	EP2307495-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**29.1**	**30.4**	**32.1**	**21.7**	**11.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0008**	<0.0002	<0.0002	**0.0004**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD367_230607	0089_SD369_230607	0089_QC113_230607	0089_SD345_230607	0089_SD350_230607
				Sampling date / time	07-Jun-2023 09:42	07-Jun-2023 10:52	07-Jun-2023 10:53	07-Jun-2023 10:53	07-Jun-2023 12:16
Compound	CAS Number	LOR	Unit		EP2307495-001	EP2307495-002	EP2307495-003	EP2307495-004	EP2307495-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0008**	<0.0002	<0.0002	**0.0004**	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0008**	<0.0002	<0.0002	**0.0004**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0008**	<0.0002	<0.0002	**0.0004**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**91.5**	**100**	**102**	**102**	**98.0**
13C8-PFOA	----	0.0002	%		**89.5**	**97.0**	**99.0**	**91.0**	**87.0**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD381_230607	0089_SD351_230607	0089_SD352_230607	0089_SD401_230607	0089_SD380_230607
				Sampling date / time	07-Jun-2023 12:17	07-Jun-2023 12:17	07-Jun-2023 12:17	07-Jun-2023 12:18	07-Jun-2023 12:18
Compound	CAS Number	LOR	Unit		EP2307495-006	EP2307495-007	EP2307495-008	EP2307495-009	EP2307495-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**14.1**	**13.4**	**14.1**	**16.0**	**13.3**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD381_230607	0089_SD351_230607	0089_SD352_230607	0089_SD401_230607	0089_SD380_230607
				Sampling date / time	07-Jun-2023 12:17	07-Jun-2023 12:17	07-Jun-2023 12:17	07-Jun-2023 12:18	07-Jun-2023 12:18
Compound	CAS Number	LOR	Unit		EP2307495-006	EP2307495-007	EP2307495-008	EP2307495-009	EP2307495-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**99.0**	**92.0**	**109**	**101**	**109**
13C8-PFOA	----	0.0002	%		**105**	**100**	**102**	**93.0**	**95.0**

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2307495**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53265	Issue Date	: 16-Jun-2023
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5105955)									
EP2307495-001	0089_SD367_230607	EA055: Moisture Content	----	0.1	%	29.1	28.0	3.9	0% - 20%
EP2307495-010	0089_SD380_230607	EA055: Moisture Content	----	0.1	%	13.3	11.5	14.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107136)									
EP2307435-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0004	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2307495-007	0089_SD351_230607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107136)									
EP2307435-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107136) - continued									
EP2307435-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2307495-007	0089_SD351_230607	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107136)									
EP2307435-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307495-007	0089_SD351_230607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107136)									
EP2307435-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307495-007	0089_SD351_230607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107136)									
EP2307435-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0004	28.6	No Limit
EP2307495-007	0089_SD351_230607	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107136)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	113	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	94.1	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	97.9	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	101	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	77.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107136)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	104	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	67.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	103	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107136)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.1	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.6	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	126	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	139	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107136)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107136) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	106	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	119	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	118	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	69.6	54.8	124
EP231P: PFAS Sums (QCLot: 5107136)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107136)							
EP2307435-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	113	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	112	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	96.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	90.3	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# 33.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107136)							
EP2307435-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	113	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	102	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	102	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	97.7	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	103	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	98.3	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	106	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	102	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	97.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	107	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	92.7	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107136)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107136) - continued							
EP2307435-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	104	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	100	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	106	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	102	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	98.5	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	91.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	# 148	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107136)							
EP2307435-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	115	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	123	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	119	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	119	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307495**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling SD - MB	Issue Date	: 16-Jun-2023
Sampler	: [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2307435--002	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	33.2 %	68.0-136%	**Recovery less than lower data quality objective**
EP231C: Perfluoroalkyl Sulfonamides	EP2307435--002	Anonymous	**N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)**	2991-50-6	148 %	61.0-139%	**Recovery greater than upper data quality objective**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD367_230607, 0089_SD369_230607, 0089_QC113_230607, 0089_SD345_230607, 0089_SD350_230607, 0089_SD381_230607, 0089_SD351_230607, 0089_SD352_230607, 0089_SD401_230607, 0089_SD380_230607	**07-Jun-2023**	**----**	----	----	**13-Jun-2023**	21-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD367_230607, 0089_SD369_230607, 0089_QC113_230607, 0089_SD345_230607, 0089_SD350_230607, 0089_SD381_230607, 0089_SD351_230607, 0089_SD352_230607, 0089_SD401_230607, 0089_SD380_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD367_230607, 0089_SD369_230607, 0089_QC113_230607, 0089_SD345_230607, 0089_SD350_230607, 0089_SD381_230607, 0089_SD351_230607, 0089_SD352_230607, 0089_SD401_230607, 0089_SD380_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD367_230607,	0089_SD369_230607,	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
0089_QC113_230607,	0089_SD345_230607,							
0089_SD350_230607,	0089_SD381_230607,							
0089_SD351_230607,	0089_SD352_230607,							
0089_SD401_230607,	0089_SD380_230607							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD367_230607,	0089_SD369_230607,	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
0089_QC113_230607,	0089_SD345_230607,							
0089_SD350_230607,	0089_SD381_230607,							
0089_SD351_230607,	0089_SD352_230607,							
0089_SD401_230607,	0089_SD380_230607							
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD367_230607,	0089_SD369_230607,	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
0089_QC113_230607,	0089_SD345_230607,							
0089_SD350_230607,	0089_SD381_230607,							
0089_SD351_230607,	0089_SD352_230607,							
0089_SD401_230607,	0089_SD380_230607							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

(ALS) COC#: 53272 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 8/6 12:40	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW139		07/06/2023 09:23 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC110		07/06/2023 09:25 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW141		07/06/2023 09:38 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW142		07/06/2023 09:48 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW147		07/06/2023 09:57 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_MW149		07/06/2023 10:09 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_MW202		07/06/2023 01:55 PM	WATER	ALS: 3 Non ALS: 0	No	X		

Environmental Division Perth

Work Order Reference

EP2307497

Telephone : +61-8-9406 1301

CHAIN OF CUSTODY

ALS COC#: 53272 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW139	HDPE (no PTFE)	20 mL	00350822082412	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00350822082396	Grey	No	
001	0089_MW139	Clear Plastic Bottle - Natural	125 mL	00070522054875	Green	No	
002	0089_QC110	HDPE (no PTFE)	20 mL	00350822082576	Grey	No	
002	0089_QC110	HDPE (no PTFE)	20 mL	00350822082433	Grey	No	
002	0089_QC110	Clear Plastic Bottle - Natural	125 mL	00070522054841	Green	No	
003	0089_MW141	HDPE (no PTFE)	20 mL	00350822082502	Grey	No	
003	0089_MW141	HDPE (no PTFE)	20 mL	00350822082407	Grey	No	
003	0089_MW141	Clear Plastic Bottle - Natural	125 mL	00070522067195	Green	No	
004	0089_MW142	HDPE (no PTFE)	20 mL	00350822082451	Grey	No	
004	0089_MW142	HDPE (no PTFE)	20 mL	00350822082374	Grey	No	
004	0089_MW142	Clear Plastic Bottle - Natural	125 mL	00070522054902	Green	No	
005	0089_MW147	HDPE (no PTFE)	20 mL	00350822082402	Grey	No	
005	0089_MW147	HDPE (no PTFE)	20 mL	00350822082385	Grey	No	
005	0089_MW147	Clear Plastic Bottle - Natural	125 mL	00070522054730	Green	No	
006	0089_MW149	HDPE (no PTFE)	20 mL	00350822082500	Grey	No	
006	0089_MW149	HDPE (no PTFE)	20 mL	00350822082297	Grey	No	
006	0089_MW149	Clear Plastic Bottle - Natural	125 mL	00070522054751	Green	No	
007	0089_MW202	HDPE (no PTFE)	20 mL	00350822082449	Grey	No	
007	0089_MW202	HDPE (no PTFE)	20 mL	00350822082569	Grey	No	
007	0089_MW202	Clear Plastic Bottle - Natural	125 mL	00070522054788	Green	No	

Total Bottle Count: ALS: 21, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307497**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53272	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - [redacted]		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 12:40	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 16-Jun-2023	Scheduled Reporting Date	: **16-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307497-001	07-Jun-2023 09:23	0089_MW139_230607	✓	✓
EP2307497-002	07-Jun-2023 09:25	0089_QC110_230607	✓	✓
EP2307497-003	07-Jun-2023 09:38	0089_MW141_230607	✓	✓
EP2307497-004	07-Jun-2023 09:48	0089_MW142_230607	✓	✓
EP2307497-005	07-Jun-2023 09:57	0089_MW147_230607	✓	✓
EP2307497-006	07-Jun-2023 10:09	0089_MW149_230607	✓	✓
EP2307497-007	07-Jun-2023 13:55	0089_MW202_230607	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307497**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 12:40
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53272	Issue Date	: 19-Jun-2023 22:50
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - Grapes		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits for sample #3, 4 and 6 due to analytes not quantified in this report. Major cations (ED093F) and major anions (ED041G/ED045G) have been confirmed by re-analysis.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_230607	0089_QC110_230607	0089_MW141_230607	0089_MW142_230607	0089_MW147_230607
				Sampling date / time	07-Jun-2023 09:23	07-Jun-2023 09:25	07-Jun-2023 09:38	07-Jun-2023 09:48	07-Jun-2023 09:57
Compound	CAS Number	LOR	Unit		EP2307497-001	EP2307497-002	EP2307497-003	EP2307497-004	EP2307497-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		196	205	410	329	573
Total Alkalinity as CaCO3	----	1	mg/L		196	205	410	329	573
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		54	68	1250	1400	706
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		500	712	9700	10300	6610
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		80	95	459	379	372
Magnesium	7439-95-4	1	mg/L		33	46	684	746	450
Sodium	7440-23-5	1	mg/L		248	364	5870	6270	3750
Potassium	7440-09-7	1	mg/L		10	14	216	244	124
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		19.1	25.6	308	326	213
ø Total Cations	----	0.01	meq/L		17.8	24.7	340	359	222
ø Ionic Balance	----	0.01	%		3.78	1.75	4.97	4.81	2.14
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	0.37	0.20	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	0.86	0.37	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	12.7	5.12	0.34
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	1.10	0.05	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	53.0	0.86	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	0.2	0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	0.80	0.42	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	7.32	4.27	0.09

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_230607	0089_QC110_230607	0089_MW141_230607	0089_MW142_230607	0089_MW147_230607
				Sampling date / time	07-Jun-2023 09:23	07-Jun-2023 09:25	07-Jun-2023 09:38	07-Jun-2023 09:48	07-Jun-2023 09:57
Compound	CAS Number	LOR	Unit		EP2307497-001	EP2307497-002	EP2307497-003	EP2307497-004	EP2307497-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.26**	**0.11**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**1.17**	**0.24**	**0.01**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	**0.02**	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_230607	0089_QC110_230607	0089_MW141_230607	0089_MW142_230607	0089_MW147_230607
				Sampling date / time	07-Jun-2023 09:23	07-Jun-2023 09:25	07-Jun-2023 09:38	07-Jun-2023 09:48	07-Jun-2023 09:57
Compound	CAS Number	LOR	Unit		EP2307497-001	EP2307497-002	EP2307497-003	EP2307497-004	EP2307497-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	**77.8**	**11.7**	**0.46**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**65.7**	**5.98**	**0.36**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**75.8**	**11.3**	**0.46**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**87.0**	**97.1**	**80.6**	**97.9**	**109**
13C8-PFOA	----	0.02	%		**99.2**	**99.6**	**101**	**102**	**103**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW149_230607	0089_MW202_230607	----	----	----
				Sampling date / time	07-Jun-2023 10:09	07-Jun-2023 13:55	----	----	----
Compound	CAS Number	LOR	Unit		EP2307497-006	EP2307497-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**217**	**356**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**217**	**356**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2300**	**45**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**15200**	**212**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**464**	**116**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1100**	**23**	----	----	----
Sodium	7440-23-5	1	mg/L		**9450**	**145**	----	----	----
Potassium	7440-09-7	1	mg/L		**337**	**5**	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**481**	**14.0**	----	----	----
ø **Total Cations**	----	0.01	meq/L		**533**	**14.1**	----	----	----
ø **Ionic Balance**	----	0.01	%		**5.16**	**0.31**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.01**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.02**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW149_230607	0089_MW202_230607	----	----	----
				Sampling date / time	07-Jun-2023 10:09	07-Jun-2023 13:55	----	----	----
Compound	CAS Number	LOR	Unit		EP2307497-006	EP2307497-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW149_230607	0089_MW202_230607	----	----	----
				Sampling date / time	07-Jun-2023 10:09	07-Jun-2023 13:55	----	----	----
Compound	CAS Number	LOR	Unit		EP2307497-006	EP2307497-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.03**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.03**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.03**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**99.3**	----	----	----
13C8-PFOA	----	0.02	%		**99.0**	**97.5**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	***Low***	***High***
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307497**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53272	Issue Date	: 19-Jun-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - Grapes		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5107360)									
EP2307493-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	125	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	125	125	0.0	0% - 20%
EP2307493-013	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	118	118	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	118	118	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5104222)									
EP2307497-001	0089_MW139_230607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	54	53	0.0	0% - 20%
EP2307498-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2350	2340	0.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5104223)									
EP2307497-001	0089_MW139_230607	ED045G: Chloride	16887-00-6	1	mg/L	500	511	2.1	0% - 20%
EP2307498-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17200	17400	1.6	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5105906)									
EP2307493-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	332	348	4.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	875	900	2.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	9000	9280	3.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	338	349	3.2	0% - 20%
EP2307498-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	486	507	4.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1240	1260	1.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10800	11000	1.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	388	394	1.4	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5105909)									
EP2307493-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	429	425	0.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1240	1240	0.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12400	12400	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	456	454	0.6	0% - 20%
EP2307500-008	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	434	422	2.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	993	961	3.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	9640	9210	4.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	332	323	3.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5108595) - continued									
EP2307493-014	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5108595)									
EP2307493-014	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5107360)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.4	87.8	118
				<1	200 mg/L	98.3	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104222)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.2	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5104223)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	88.6	113
				<1	1000 mg/L	98.5	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5105906)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.4	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.7	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5105909)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	88.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.0	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107836)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.5	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	98.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	90.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	86.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	107	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	111	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5108595)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	111	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5108595) - continued								
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	120	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	97.5	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	123	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	105	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107836)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	93.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	97.6	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5108595)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	114	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	103	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	113	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107836)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	87.4	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	85.6	60.5	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107836) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	91.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	95.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	114	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5108595)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	81.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	119	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.5	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	90.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107836)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	97.5	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	92.1	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	90.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	95.8	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5108595)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	122	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	114	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	113	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	106	64.2	133
EP231P: PFAS Sums (QCLot: 5107836)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5108595)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5108595) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104222)							
EP2307497-001	0089_MW139_230607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	90.3	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5104223)							
EP2307497-001	0089_MW139_230607	ED045G: Chloride	16887-00-6	1000 mg/L	86.5	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307497**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling GW - [redacted]	Issue Date	: 19-Jun-2023
Sampler	: [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	22	4.55	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	22	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW139_230607, 0089_QC110_230607, 0089_MW141_230607, 0089_MW142_230607, 0089_MW147_230607, 0089_MW149_230607, 0089_MW202_230607	**07-Jun-2023**	**----**	----	**----**	**13-Jun-2023**	21-Jun-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW139_230607, 0089_QC110_230607, 0089_MW141_230607, 0089_MW142_230607, 0089_MW147_230607, 0089_MW149_230607, 0089_MW202_230607	**07-Jun-2023**	**----**	----	**----**	**16-Jun-2023**	05-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW139_230607, 0089_QC110_230607, 0089_MW141_230607, 0089_MW142_230607, 0089_MW147_230607, 0089_MW149_230607, 0089_MW202_230607	**07-Jun-2023**	**----**	----	**----**	**16-Jun-2023**	05-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW139_230607, 0089_MW141_230607, 0089_MW147_230607, 0089_MW202_230607, 0089_QC110_230607, 0089_MW142_230607, 0089_MW149_230607,	**07-Jun-2023**	**----**	----	**----**	**14-Jun-2023**	14-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_230607, 0089_MW141_230607, 0089_MW147_230607, 0089_MW202_230607, 0089_QC110_230607, 0089_MW142_230607, 0089_MW149_230607,	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	04-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_230607, 0089_MW141_230607, 0089_MW147_230607, 0089_MW202_230607, 0089_QC110_230607, 0089_MW142_230607, 0089_MW149_230607,	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	04-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW139_230607, 0089_MW141_230607, 0089_MW147_230607, 0089_MW202_230607, 0089_QC110_230607, 0089_MW142_230607, 0089_MW149_230607,	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	04-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_230607, 0089_MW141_230607, 0089_MW147_230607, 0089_MW202_230607, 0089_QC110_230607, 0089_MW142_230607, 0089_MW149_230607,	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	04-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW139_230607, 0089_MW141_230607, 0089_MW147_230607, 0089_MW202_230607, 0089_QC110_230607, 0089_MW142_230607, 0089_MW149_230607,	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	04-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	22	**4.55**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	22	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

(ALS) COC#: 53273 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 8/6 12:40	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free Ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW150		07/06/2023 10:48 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC115		07/06/2023 10:49 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_SW152		07/06/2023 10:52 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_SW154		07/06/2023 10:52 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_SW156		07/06/2023 10:53 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_PW356		07/06/2023 11:20 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_QC116		07/06/2023 11:21 AM	WATER	ALS: 3 Non ALS: 0	No	X		
008	0089_PW331		07/06/2023 11:23 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_PW329		07/06/2023 11:24 AM	WATER	ALS: 3 Non ALS: 0	No	X		

Environmental Division
Perth
Work Order Reference
EP2307498

Telephone : +61-8-9406 1301

Wednesday, June 7, 2023 8:55:36 AM

CHAIN OF CUSTODY

(ALS) COC#: 53273 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free Ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_PW358		07/06/2023 11:25 AM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_PW330		07/06/2023 11:26 AM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_PW357		07/06/2023 11:27 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 53273 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW150	HDPE (no PTFE)	20 mL	00350822082582	Grey	No	
001	0089_SW150	HDPE (no PTFE)	20 mL	00350822082378	Grey	No	
001	0089_SW150	Clear Plastic Bottle - Natural	125 mL	00070522054822	Green	No	
002	0089_QC115	HDPE (no PTFE)	20 mL	00350822082460	Grey	No	
002	0089_QC115	HDPE (no PTFE)	20 mL	00350822082397	Grey	No	
002	0089_QC115	Clear Plastic Bottle - Natural	125 mL	00070522054820	Green	No	
003	0089_SW152	HDPE (no PTFE)	20 mL	00350822082311	Grey	No	
003	0089_SW152	HDPE (no PTFE)	20 mL	00350822082346	Grey	No	
003	0089_SW152	Clear Plastic Bottle - Natural	125 mL	00070522054748	Green	No	
004	0089_SW154	HDPE (no PTFE)	20 mL	00350822082322	Grey	No	
004	0089_SW154	HDPE (no PTFE)	20 mL	00350822082313	Grey	No	
004	0089_SW154	Clear Plastic Bottle - Natural	125 mL	00070522054713	Green	No	
005	0089_SW156	HDPE (no PTFE)	20 mL	00350822082352	Grey	No	
005	0089_SW156	HDPE (no PTFE)	20 mL	00350822082323	Grey	No	
005	0089_SW156	Clear Plastic Bottle - Natural	125 mL	00070522054837	Green	No	
006	0089_PW356	HDPE (no PTFE)	20 mL	00350822082364	Grey	No	
006	0089_PW356	HDPE (no PTFE)	20 mL	00350822082587	Grey	No	
006	0089_PW356	Clear Plastic Bottle - Natural	125 mL	00070522054737	Green	No	
007	0089_QC116	HDPE (no PTFE)	20 mL	00350822082390	Grey	No	
007	0089_QC116	HDPE (no PTFE)	20 mL	00350822082375	Grey	No	
007	0089_QC116	Clear Plastic Bottle - Natural	125 mL	00070522054856	Green	No	
008	0089_PW331	HDPE (no PTFE)	20 mL	00350822082386	Grey	No	
008	0089_PW331	HDPE (no PTFE)	20 mL	00350822082335	Grey	No	
008	0089_PW331	Clear Plastic Bottle - Natural	125 mL	00070522054781	Green	No	
009	0089_PW329	HDPE (no PTFE)	20 mL	00350822082479	Grey	No	
009	0089_PW329	HDPE (no PTFE)	20 mL	00350822082589	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 53273 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_PW329	Clear Plastic Bottle - Natural	125 mL	00070522054863	Green	No	
010	0089_PW358	HDPE (no PTFE)	20 mL	0035081533853645	Grey	No	
010	0089_PW358	HDPE (no PTFE)	20 mL	00350822082526	Grey	No	
010	0089_PW358	Clear Plastic Bottle - Natural	125 mL	00070522054804	Green	No	
011	0089_PW330	HDPE (no PTFE)	20 mL	00350822082382	Grey	No	
011	0089_PW330	HDPE (no PTFE)	20 mL	00350822082519	Grey	No	
011	0089_PW330	Clear Plastic Bottle - Natural	125 mL	00070522054724	Green	No	
012	0089_PW357	HDPE (no PTFE)	20 mL	00350822082406	Grey	No	
012	0089_PW357	HDPE (no PTFE)	20 mL	00350822082537	Grey	No	
012	0089_PW357	Clear Plastic Bottle - Natural	125 mL	00070522054777	Green	No	

Total Bottle Count: ALS: 36, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307498**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53273	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - [redacted]		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 12:40	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 19-Jun-2023	Scheduled Reporting Date	: **19-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 12 / 12

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307498-001	07-Jun-2023 10:48	0089_SW150_230607	✓	✓
EP2307498-002	07-Jun-2023 10:49	0089_QC115_230607	✓	✓
EP2307498-003	07-Jun-2023 10:52	0089_SW152_230607	✓	✓
EP2307498-004	07-Jun-2023 10:52	0089_SW154_230607	✓	✓
EP2307498-005	07-Jun-2023 10:53	0089_SW156_230607	✓	✓
EP2307498-006	07-Jun-2023 11:20	0089_PW356_230607	✓	✓
EP2307498-007	07-Jun-2023 11:21	0089_QC116_230607	✓	✓
EP2307498-008	07-Jun-2023 11:23	0089_PW331_230607	✓	✓
EP2307498-009	07-Jun-2023 11:24	0089_PW329_230607	✓	✓
EP2307498-010	07-Jun-2023 11:25	0089_PW358_230607	✓	✓
EP2307498-011	07-Jun-2023 11:26	0089_PW330_230607	✓	✓
EP2307498-012	07-Jun-2023 11:27	0089_PW357_230607	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307498**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 12:40
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53273	Issue Date	: 19-Jun-2023 22:38
Sampler	: [redacted]		
Site	: Stirling SW/PW - [redacted]		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW330_230607	0089_PW357_230607	----	----	----
				Sampling date / time	07-Jun-2023 11:26	07-Jun-2023 11:27	----	----	----
Compound	CAS Number	LOR	Unit		EP2307498-011	EP2307498-012	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**168**	**169**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**168**	**169**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2670**	**2620**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17400**	**17200**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**513**	**487**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1220**	**1220**	----	----	----
Sodium	7440-23-5	1	mg/L		**10500**	**10700**	----	----	----
Potassium	7440-09-7	1	mg/L		**389**	**396**	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**550**	**543**	----	----	----
ø **Total Cations**	----	0.01	meq/L		**593**	**600**	----	----	----
ø **Ionic Balance**	----	0.01	%		**3.76**	**5.00**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW330_230607	0089_PW357_230607	----	----	----
				Sampling date / time	07-Jun-2023 11:26	07-Jun-2023 11:27	----	----	----
Compound	CAS Number	LOR	Unit		EP2307498-011	EP2307498-012	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW330_230607	0089_PW357_230607	----	----	----
				Sampling date / time	07-Jun-2023 11:26	07-Jun-2023 11:27	----	----	----
Compound	CAS Number	LOR	Unit		EP2307498-011	EP2307498-012	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**113**	----	----	----
13C8-PFOA	----	0.02	%		**107**	**106**	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW150_230607	0089_QC115_230607	0089_SW152_230607	0089_SW154_230607	0089_SW156_230607
				Sampling date / time	07-Jun-2023 10:48	07-Jun-2023 10:49	07-Jun-2023 10:52	07-Jun-2023 10:52	07-Jun-2023 10:53
Compound	CAS Number	LOR	Unit		EP2307498-001	EP2307498-002	EP2307498-003	EP2307498-004	EP2307498-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**136**	**119**	**120**	**120**	**120**
Total Alkalinity as CaCO3	----	1	mg/L		**136**	**119**	**120**	**120**	**120**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2530**	**2690**	**2490**	**2350**	**2540**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17400**	**17600**	**17400**	**17200**	**17200**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**486**	**485**	**477**	**485**	**464**
Magnesium	7439-95-4	1	mg/L		**1240**	**1240**	**1240**	**1250**	**1220**
Sodium	7440-23-5	1	mg/L		**10800**	**10700**	**10800**	**10900**	**10700**
Potassium	7440-09-7	1	mg/L		**388**	**378**	**384**	**395**	**388**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**546**	**555**	**545**	**536**	**540**
ø Total Cations	----	0.01	meq/L		**606**	**601**	**605**	**611**	**599**
ø Ionic Balance	----	0.01	%		**5.19**	**4.02**	**5.25**	**6.52**	**5.13**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW150_230607	0089_QC115_230607	0089_SW152_230607	0089_SW154_230607	0089_SW156_230607
				Sampling date / time	07-Jun-2023 10:48	07-Jun-2023 10:49	07-Jun-2023 10:52	07-Jun-2023 10:52	07-Jun-2023 10:53
Compound	CAS Number	LOR	Unit		EP2307498-001	EP2307498-002	EP2307498-003	EP2307498-004	EP2307498-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW150_230607	0089_QC115_230607	0089_SW152_230607	0089_SW154_230607	0089_SW156_230607
				Sampling date / time	07-Jun-2023 10:48	07-Jun-2023 10:49	07-Jun-2023 10:52	07-Jun-2023 10:52	07-Jun-2023 10:53
Compound	CAS Number	LOR	Unit		EP2307498-001	EP2307498-002	EP2307498-003	EP2307498-004	EP2307498-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**107**	**107**	**107**	**106**
13C8-PFOA	----	0.02	%		**109**	**106**	**104**	**106**	**109**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_230607	0089_QC116_230607	0089_PW331_230607	0089_PW329_230607	0089_PW358_230607
				Sampling date / time	07-Jun-2023 11:20	07-Jun-2023 11:21	07-Jun-2023 11:23	07-Jun-2023 11:24	07-Jun-2023 11:25
Compound	CAS Number	LOR	Unit		EP2307498-006	EP2307498-007	EP2307498-008	EP2307498-009	EP2307498-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**259**	**266**	**268**	**269**	**167**
Total Alkalinity as CaCO3	----	1	mg/L		**259**	**266**	**268**	**269**	**167**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2670**	**2460**	**2410**	**2240**	**2360**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17200**	**17200**	**17000**	**17400**	**17400**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**507**	**502**	**496**	**502**	**522**
Magnesium	7439-95-4	1	mg/L		**1250**	**1250**	**1240**	**1240**	**1260**
Sodium	7440-23-5	1	mg/L		**10700**	**10700**	**10600**	**10600**	**11000**
Potassium	7440-09-7	1	mg/L		**375**	**402**	**394**	**394**	**397**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**546**	**542**	**535**	**543**	**543**
ø Total Cations	----	0.01	meq/L		**603**	**604**	**598**	**598**	**618**
ø Ionic Balance	----	0.01	%		**4.98**	**5.40**	**5.55**	**4.86**	**6.46**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_230607	0089_QC116_230607	0089_PW331_230607	0089_PW329_230607	0089_PW358_230607
				Sampling date / time	07-Jun-2023 11:20	07-Jun-2023 11:21	07-Jun-2023 11:23	07-Jun-2023 11:24	07-Jun-2023 11:25
Compound	CAS Number	LOR	Unit		EP2307498-006	EP2307498-007	EP2307498-008	EP2307498-009	EP2307498-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_230607	0089_QC116_230607	0089_PW331_230607	0089_PW329_230607	0089_PW358_230607
				Sampling date / time	07-Jun-2023 11:20	07-Jun-2023 11:21	07-Jun-2023 11:23	07-Jun-2023 11:24	07-Jun-2023 11:25
Compound	CAS Number	LOR	Unit		EP2307498-006	EP2307498-007	EP2307498-008	EP2307498-009	EP2307498-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**108**	**110**	**92.1**	**102**	**103**
13C8-PFOA	----	0.02	%		**108**	**109**	**102**	**108**	**107**

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307498**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53273	Issue Date	: 19-Jun-2023
Sampler	: [redacted]		
Site	: Stirling SW/PW - [redacted]		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5107530)									
EP2307498-002	0089_QC115_230607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	119	134	12.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	119	134	12.1	0% - 20%
EP2307498-012	0089_PW357_230607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	169	189	10.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	169	189	10.7	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5104222)									
EP2307497-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	54	53	0.0	0% - 20%
EP2307498-004	0089_SW154_230607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2350	2340	0.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5104223)									
EP2307497-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	500	511	2.1	0% - 20%
EP2307498-004	0089_SW154_230607	ED045G: Chloride	16887-00-6	1	mg/L	17200	17400	1.6	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5105906)									
EP2307493-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	332	348	4.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	875	900	2.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	9000	9280	3.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	338	349	3.2	0% - 20%
EP2307498-001	0089_SW150_230607	ED093F: Calcium	7440-70-2	1	mg/L	486	507	4.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1240	1260	1.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10800	11000	1.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	388	394	1.4	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5105907)									
EP2307498-011	0089_PW330_230607	ED093F: Calcium	7440-70-2	1	mg/L	513	474	7.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1220	1210	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10500	10600	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	389	387	0.6	0% - 20%
EP2307502-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	445	432	3.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1320	1280	2.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	13200	13000	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	481	473	1.8	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107841)									
EP2307500-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107841)									
EP2307500-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.3	<0.3	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107841)									
EP2307500-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107841) - continued									
EP2307500-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107841)									
EP2307500-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107841)									
EP2307500-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.05	0.05	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5107530)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	98.6	87.8	118
				<1	200 mg/L	98.8	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104222)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.2	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5104223)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	88.6	113
				<1	1000 mg/L	98.5	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5105906)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.4	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.7	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5105907)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	95.0	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.0	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107841)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	112	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	118	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	99.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	95.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107841)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	112	73.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107841) - continued								
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	93.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	99.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	89.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	105	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	99.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	91.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107841)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	94.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	86.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	99.5	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	101	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	90.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	115	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107841)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	114	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	114	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	114	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	110	64.2	133
EP231P: PFAS Sums (QCLot: 5107841)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104222)							
EP2307497-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	90.3	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5104223)							
EP2307497-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	86.5	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107841)							
EP2307500-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.9	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	92.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	75.5	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	106	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	99.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	107	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107841)							
EP2307500-008	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	112	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	103	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	83.9	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	90.3	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	110	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	92.7	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	99.2	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	99.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	97.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	102	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	94.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107841)							
EP2307500-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	90.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	84.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	114	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	119	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	97.9	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107841)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107841) - continued							
EP2307500-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	123	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	113	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	103	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	97.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307498**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling SW/PW - [redacted]	Issue Date	: 19-Jun-2023
Sampler	: [redacted]	No. of samples received	: 12
Order number	: pfas-omp/Stirling	No. of samples analysed	: 12

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
	1				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	20	5.00	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW150_230607, 0089_QC115_230607, 0089_SW152_230607, 0089_SW154_230607, 0089_SW156_230607, 0089_PW356_230607, 0089_QC116_230607, 0089_PW331_230607, 0089_PW329_230607, 0089_PW358_230607, 0089_PW330_230607, 0089_PW357_230607	**07-Jun-2023**	----	----	----	**13-Jun-2023**	21-Jun-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW150_230607, 0089_QC115_230607, 0089_SW152_230607, 0089_SW154_230607, 0089_SW156_230607, 0089_PW356_230607, 0089_QC116_230607, 0089_PW331_230607, 0089_PW329_230607, 0089_PW358_230607, 0089_PW330_230607, 0089_PW357_230607	**07-Jun-2023**	----	----	----	**16-Jun-2023**	05-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW150_230607, 0089_QC115_230607, 0089_SW152_230607, 0089_SW154_230607, 0089_SW156_230607, 0089_PW356_230607, 0089_QC116_230607, 0089_PW331_230607, 0089_PW329_230607, 0089_PW358_230607, 0089_PW330_230607, 0089_PW357_230607	**07-Jun-2023**	----	----	----	**16-Jun-2023**	05-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW150_230607, 0089_QC115_230607, 0089_SW152_230607, 0089_SW154_230607, 0089_SW156_230607, 0089_PW356_230607, 0089_QC116_230607, 0089_PW331_230607, 0089_PW329_230607, 0089_PW358_230607, 0089_PW330_230607, 0089_PW357_230607	**07-Jun-2023**	**----**	----	**----**	**14-Jun-2023**	14-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW150_230607, 0089_QC115_230607, 0089_SW152_230607, 0089_SW154_230607, 0089_SW156_230607, 0089_PW356_230607, 0089_QC116_230607, 0089_PW331_230607, 0089_PW329_230607, 0089_PW358_230607, 0089_PW330_230607, 0089_PW357_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW150_230607, 0089_QC115_230607, 0089_SW152_230607, 0089_SW154_230607, 0089_SW156_230607, 0089_PW356_230607, 0089_QC116_230607, 0089_PW331_230607, 0089_PW329_230607, 0089_PW358_230607, 0089_PW330_230607, 0089_PW357_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW150_230607, 0089_QC115_230607, 0089_SW152_230607, 0089_SW154_230607, 0089_SW156_230607, 0089_PW356_230607, 0089_QC116_230607, 0089_PW331_230607, 0089_PW329_230607, 0089_PW358_230607, 0089_PW330_230607, 0089_PW357_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW150_230607, 0089_QC115_230607, 0089_SW152_230607, 0089_SW154_230607, 0089_SW156_230607, 0089_PW356_230607, 0089_QC116_230607, 0089_PW331_230607, 0089_PW329_230607, 0089_PW358_230607, 0089_PW330_230607, 0089_PW357_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW150_230607, 0089_QC115_230607, 0089_SW152_230607, 0089_SW154_230607, 0089_SW156_230607, 0089_PW356_230607, 0089_QC116_230607, 0089_PW331_230607, 0089_PW329_230607, 0089_PW358_230607, 0089_PW330_230607, 0089_PW357_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 53274 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 8/6 1240	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD356		07/06/2023 10:24 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_QC114		07/06/2023 10:25 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD331		07/06/2023 10:25 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD330		07/06/2023 10:26 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD357		07/06/2023 10:26 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD358		07/06/2023 10:27 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD329		07/06/2023 10:27 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

Environmental Division Perth

Work Order Reference

EP2307499

Telephone : -- 61-8-9406 1301

CHAIN OF CUSTODY

ALS COC#: 53274 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD356	HDPE Soil Jar	200 mL	00621122035142	Grey	No	
002	0089_QC114	HDPE Soil Jar	200 mL	00621122035206	Grey	No	
003	0089_SD331	HDPE Soil Jar	200 mL	00621122035198	Grey	No	
004	0089_SD330	HDPE Soil Jar	200 mL	00621122035160	Grey	No	
005	0089_SD357	HDPE Soil Jar	200 mL	00621122035224	Grey	No	
006	0089_SD358	HDPE Soil Jar	200 mL	00621122035219	Grey	No	
007	0089_SD329	HDPE Soil Jar	200 mL	00621122035117	Grey	No	

Total Bottle Count: ALS: 7, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307499**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53274	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - [redacted]		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 12:40	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 16-Jun-2023	Scheduled Reporting Date	: **16-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2307499-001	07-Jun-2023 10:24	0089_SD356_230607	✓	✓
EP2307499-002	07-Jun-2023 10:25	0089_QC114_230607	✓	✓
EP2307499-003	07-Jun-2023 10:25	0089_SD331_230607	✓	✓
EP2307499-004	07-Jun-2023 10:26	0089_SD330_230607	✓	✓
EP2307499-005	07-Jun-2023 10:26	0089_SD357_230607	✓	✓
EP2307499-006	07-Jun-2023 10:27	0089_SD358_230607	✓	✓
EP2307499-007	07-Jun-2023 10:27	0089_SD329_230607	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307499**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 12:40
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53274	Issue Date	: 16-Jun-2023 11:25
Sampler	: [redacted]		
Site	: Stirling SD - [redacted]		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD356_230607	0089_QC114_230607	0089_SD331_230607	0089_SD330_230607	0089_SD357_230607
			Sampling date / time	07-Jun-2023 10:24	07-Jun-2023 10:25	07-Jun-2023 10:25	07-Jun-2023 10:26	07-Jun-2023 10:26
Compound	CAS Number	LOR	Unit	EP2307499-001	EP2307499-002	EP2307499-003	EP2307499-004	EP2307499-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**11.7**	**11.7**	**19.4**	**15.2**	**15.2**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD356_230607	0089_QC114_230607	0089_SD331_230607	0089_SD330_230607	0089_SD357_230607
				Sampling date / time	07-Jun-2023 10:24	07-Jun-2023 10:25	07-Jun-2023 10:25	07-Jun-2023 10:26	07-Jun-2023 10:26
Compound	CAS Number	LOR	Unit		EP2307499-001	EP2307499-002	EP2307499-003	EP2307499-004	EP2307499-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**101**	**110**	**96.0**	**94.0**	**90.5**
13C8-PFOA	----	0.0002	%		**91.5**	**91.5**	**89.0**	**94.0**	**96.0**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD358_230607	0089_SD329_230607	----	----	----
				Sampling date / time	07-Jun-2023 10:27	07-Jun-2023 10:27	----	----	----
Compound	CAS Number	LOR	Unit		EP2307499-006	EP2307499-007	--------	--------	--------
					Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**6.6**	**18.2**	**----**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	**----**	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	**----**	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	**----**	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD358_230607	0089_SD329_230607	----	----	----
			Sampling date / time	07-Jun-2023 10:27	07-Jun-2023 10:27	----	----	----
Compound	CAS Number	LOR	Unit	EP2307499-006	EP2307499-007	--------	--------	--------
				Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**95.5**	**105**	----	----	----
13C8-PFOA	----	0.0002	%	**95.0**	**97.5**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2307499**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53274	Issue Date	: 16-Jun-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - [redacted]		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5105955)									
EP2307495-001	Anonymous	EA055: Moisture Content	----	0.1	%	29.1	28.0	3.9	0% - 20%
EP2307495-010	Anonymous	EA055: Moisture Content	----	0.1	%	13.3	11.5	14.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107138)									
EP2307499-001	0089_SD356_230607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2307501-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107138)									
EP2307499-001	0089_SD356_230607	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107138) - continued									
EP2307499-001	0089_SD356_230607	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2307501-004	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107138)									
EP2307499-001	0089_SD356_230607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307501-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107138)									
EP2307499-001	0089_SD356_230607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307501-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107138)									
EP2307499-001	0089_SD356_230607	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2307501-004	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107138)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	101	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	96.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	88.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	106	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	83.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107138)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	102	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	115	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107138)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107138)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107138) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	98.3	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	88.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	115	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	77.9	54.8	124
EP231P: PFAS Sums (QCLot: 5107138)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107138)							
EP2307499-002	0089_QC114_230607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	93.7	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	84.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	89.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	90.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	100	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	86.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107138)							
EP2307499-002	0089_QC114_230607	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	103	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	100	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	99.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	104	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	105	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	104	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	88.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	105	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	98.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	83.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	116	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107138)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107138) - continued							
EP2307499-002	0089_QC114_230607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	90.4	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	125	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	115	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	114	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	103	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	85.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	61.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107138)							
EP2307499-002	0089_QC114_230607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	95.7	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	112	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	123	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	68.1	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307499**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling SD - [redacted]	Issue Date	: 16-Jun-2023
Sampler	: [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD356_230607, 0089_QC114_230607, 0089_SD331_230607, 0089_SD330_230607, 0089_SD357_230607, 0089_SD358_230607, 0089_SD329_230607	**07-Jun-2023**	**----**	----	----	**13-Jun-2023**	21-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_230607, 0089_QC114_230607, 0089_SD331_230607, 0089_SD330_230607, 0089_SD357_230607, 0089_SD358_230607, 0089_SD329_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_230607, 0089_QC114_230607, 0089_SD331_230607, 0089_SD330_230607, 0089_SD357_230607, 0089_SD358_230607, 0089_SD329_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD356_230607, 0089_QC114_230607, 0089_SD331_230607, 0089_SD330_230607, 0089_SD357_230607, 0089_SD358_230607, 0089_SD329_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_230607, 0089_QC114_230607, 0089_SD331_230607, 0089_SD330_230607, 0089_SD357_230607, 0089_SD358_230607, 0089_SD329_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD356_230607, 0089_QC114_230607, 0089_SD331_230607, 0089_SD330_230607, 0089_SD357_230607, 0089_SD358_230607, 0089_SD329_230607	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

(ALS) COC#: 53275 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW245		07/06/2023 08:46 AM	WATER	ALS: 5 Non ALS: 0	No	X		
002	0089_MW243		07/06/2023 08:49 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW239		07/06/2023 08:50 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW240		07/06/2023 08:51 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW238		07/06/2023 08:51 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_MW286		07/06/2023 09:44 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_MW124		07/06/2023 12:23 PM	WATER	ALS: 3 Non ALS: 0	No	X		
008	0089_MW125		07/06/2023 12:54 PM	WATER	ALS: 5 Non ALS: 0	No	X		
009	0089_MW126		07/06/2023 12:57 PM	WATER	ALS: 3 Non ALS: 0	No	X		

Environmental Division Perth

Work Order Reference

EP2307500

Telephone : +61-8-9406 1301

CHAIN OF CUSTODY

ALS COC#: 53275 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW127		07/06/2023 12:58 PM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 53275 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW245	HDPE (no PTFE)	20 mL	00350822082425	Grey	No	
001	0089_MW245	HDPE (no PTFE)	20 mL	00350822082457	Grey	No	
001	0089_MW245	HDPE (no PTFE)	20 mL	00350822082832	Grey	No	
001	0089_MW245	Clear Plastic Bottle - Natural	125 mL	00070522067294	Green	No	
002	0089_MW243	HDPE (no PTFE)	20 mL	00350822082773	Grey	No	
002	0089_MW243	Clear Plastic Bottle - Natural	125 mL	00070522054821	Green	No	
002	0089_MW243	HDPE (no PTFE)	20 mL	00350822082757	Grey	No	
003	0089_MW239	HDPE (no PTFE)	20 mL	00350822082802	Grey	No	
003	0089_MW239	Clear Plastic Bottle - Natural	125 mL	00070522054720	Green	No	
003	0089_MW239	HDPE (no PTFE)	20 mL	00350822082813	Grey	No	
004	0089_MW240	HDPE (no PTFE)	20 mL	00350822082674	Grey	No	
004	0089_MW240	HDPE (no PTFE)	20 mL	00350822082649	Grey	No	
004	0089_MW240	Clear Plastic Bottle - Natural	125 mL	00070522054783	Green	No	
005	0089_MW238	HDPE (no PTFE)	20 mL	00350822082735	Grey	No	
005	0089_MW238	Clear Plastic Bottle - Natural	125 mL	00070522054929	Green	No	
005	0089_MW238	HDPE (no PTFE)	20 mL	00350822082660	Grey	No	
006	0089_MW286	HDPE (no PTFE)	20 mL	00350822082632	Grey	No	
006	0089_MW286	Clear Plastic Bottle - Natural	125 mL	00070522189231	Green	No	
006	0089_MW286	HDPE (no PTFE)	20 mL	00350821008393	Grey	No	
007	0089_MW124	HDPE (no PTFE)	20 mL	00350821008505	Grey	No	
007	0089_MW124	Clear Plastic Bottle - Natural	125 mL	00070522054800	Green	No	
007	0089_MW124	HDPE (no PTFE)	20 mL	00350822082626	Grey	No	
008	0089_MW125	HDPE (no PTFE)	20 mL	00350822082709	Grey	No	
008	0089_MW125	Clear Plastic Bottle - Natural	125 mL	00070522045896	Green	No	
008	0089_MW125	HDPE (no PTFE)	20 mL	00350822057882	Grey	No	
		HDPE (no PTFE)	20 mL	00350822081546	Grey	No	

CHAIN OF CUSTODY

COC#: 53275 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_MW125	HDPE (no PTFE)	20 mL	00350822082365	Grey	No	
008	0089_MW125	HDPE (no PTFE)	20 mL	00350822082395	Grey	No	
009	0089_MW126	Clear Plastic Bottle - Natural	125 mL	00070522189365	Green	No	
009	0089_MW126	HDPE (no PTFE)	20 mL	00350821008357	Grey	No	
009	0089_MW126	HDPE (no PTFE)	20 mL	00350821008402	Grey	No	
010	0089_MW127	Clear Plastic Bottle - Natural	125 mL	00070522054739	Green	No	
010	0089_MW127	HDPE (no PTFE)	20 mL	00350822082333	Grey	No	
010	0089_MW127	HDPE (no PTFE)	20 mL	00350822082593	Grey	No	
010	0089_MW127	HDPE (no PTFE)	20 mL	00350822082551	Grey	No	
010	0089_MW127	HDPE (no PTFE)	20 mL	00350822082432	Grey	No	

Total Bottle Count: ALS: 36, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307500**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53275	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 12:40	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 19-Jun-2023	Scheduled Reporting Date	: **19-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307500-001	07-Jun-2023 08:46	0089_MW245_230607	✓	✓
EP2307500-002	07-Jun-2023 08:49	0089_MW243_230607	✓	✓
EP2307500-003	07-Jun-2023 08:50	0089_MW239_230607	✓	✓
EP2307500-004	07-Jun-2023 08:51	0089_MW240_230607	✓	✓
EP2307500-005	07-Jun-2023 08:51	0089_MW238_230607	✓	✓
EP2307500-006	07-Jun-2023 09:44	0089_MW286_230607	✓	✓
EP2307500-007	07-Jun-2023 12:23	0089_MW124_230607	✓	✓
EP2307500-008	07-Jun-2023 12:54	0089_MW125_230607	✓	✓
EP2307500-009	07-Jun-2023 12:57	0089_MW126_230607	✓	✓
EP2307500-010	07-Jun-2023 12:58	0089_MW127_230607	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307500**	Page	: 1 of 9
Amendment	: **1**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 12:40
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53275	Issue Date	: 20-Jun-2023 14:28
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X: The LOR of PFBA has been raised on sample '0089_MW245_230607' due to sample matrix interference.
- Amendment (19/06/2023): This report has been amended as a result of misinterpretation of sample identification numbers (IDs) for samples EP2307500_006 [0089_MW288_230607]. All analysis results are as per the previous report.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW245_230607	0089_MW243_230607	0089_MW239_230607	0089_MW240_230607	0089_MW238_230607
				Sampling date / time	07-Jun-2023 08:46	07-Jun-2023 08:49	07-Jun-2023 08:50	07-Jun-2023 08:51	07-Jun-2023 08:51
Compound	CAS Number	LOR	Unit		EP2307500-001	EP2307500-002	EP2307500-003	EP2307500-004	EP2307500-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		481	282	223	260	219
Total Alkalinity as CaCO3	----	1	mg/L		481	282	223	260	219
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		4	54	61	84	72
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		28	81	36	46	41
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		160	122	98	113	89
Magnesium	7439-95-4	1	mg/L		18	17	13	12	14
Sodium	7440-23-5	1	mg/L		25	37	19	29	26
Potassium	7440-09-7	1	mg/L		4	5	2	2	3
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		10.5	9.04	6.74	8.24	7.03
ø Total Cations	----	0.01	meq/L		10.6	9.22	6.84	7.94	6.80
ø Ionic Balance	----	0.01	%		0.81	0.99	0.71	1.87	1.66
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	0.03	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.03	0.06	0.15	0.57	0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.02	0.12	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.3	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW245_230607	0089_MW243_230607	0089_MW239_230607	0089_MW240_230607	0089_MW238_230607
				Sampling date / time	07-Jun-2023 08:46	07-Jun-2023 08:49	07-Jun-2023 08:50	07-Jun-2023 08:51	07-Jun-2023 08:51
Compound	CAS Number	LOR	Unit		EP2307500-001	EP2307500-002	EP2307500-003	EP2307500-004	EP2307500-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.01**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW245_230607	0089_MW243_230607	0089_MW239_230607	0089_MW240_230607	0089_MW238_230607
				Sampling date / time	07-Jun-2023 08:46	07-Jun-2023 08:49	07-Jun-2023 08:50	07-Jun-2023 08:51	07-Jun-2023 08:51
Compound	CAS Number	LOR	Unit		EP2307500-001	EP2307500-002	EP2307500-003	EP2307500-004	EP2307500-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.05**	**0.18**	**0.15**	**0.63**	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.05**	**0.18**	**0.15**	**0.57**	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.05**	**0.18**	**0.15**	**0.60**	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**112**	**106**	**98.6**	**109**	**97.1**
13C8-PFOA	----	0.02	%		**105**	**107**	**105**	**107**	**112**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_230607	0089_MW124_230607	0089_MW125_230607	0089_MW126_230607	0089_MW127_230607
				Sampling date / time	07-Jun-2023 09:44	07-Jun-2023 12:23	07-Jun-2023 12:54	07-Jun-2023 12:57	07-Jun-2023 12:58
Compound	CAS Number	LOR	Unit		EP2307500-006	EP2307500-007	EP2307500-008	EP2307500-009	EP2307500-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**309**	**338**	**354**	**559**	**522**
Total Alkalinity as CaCO3	----	1	mg/L		**309**	**338**	**354**	**559**	**522**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**31**	**1680**	**2030**	**1480**	**1630**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**71**	**12400**	**14500**	**12100**	**13100**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**105**	**378**	**434**	**366**	**368**
Magnesium	7439-95-4	1	mg/L		**16**	**858**	**993**	**815**	**914**
Sodium	7440-23-5	1	mg/L		**34**	**8450**	**9640**	**7580**	**8240**
Potassium	7440-09-7	1	mg/L		**6**	**285**	**332**	**253**	**272**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**8.82**	**392**	**458**	**383**	**414**
ø Total Cations	----	0.01	meq/L		**8.19**	**464**	**531**	**422**	**459**
ø Ionic Balance	----	0.01	%		**3.72**	**8.51**	**7.36**	**4.75**	**5.16**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.23**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	**0.31**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.01**	<0.01	**0.84**	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.22**	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	**0.04**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**0.24**	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_230607	0089_MW124_230607	0089_MW125_230607	0089_MW126_230607	0089_MW127_230607
				Sampling date / time	07-Jun-2023 09:44	07-Jun-2023 12:23	07-Jun-2023 12:54	07-Jun-2023 12:57	07-Jun-2023 12:58
Compound	CAS Number	LOR	Unit		EP2307500-006	EP2307500-007	EP2307500-008	EP2307500-009	EP2307500-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_230607	0089_MW124_230607	0089_MW125_230607	0089_MW126_230607	0089_MW127_230607
				Sampling date / time	07-Jun-2023 09:44	07-Jun-2023 12:23	07-Jun-2023 12:54	07-Jun-2023 12:57	07-Jun-2023 12:58
Compound	CAS Number	LOR	Unit		EP2307500-006	EP2307500-007	EP2307500-008	EP2307500-009	EP2307500-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**1.23**	<0.01	**1.66**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.23**	<0.01	**0.84**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.23**	<0.01	**1.35**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**106**	**97.6**	**102**	**97.1**
13C8-PFOA	----	0.02	%		**107**	**106**	**107**	**93.9**	**103**

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307500**	Page	: 1 of 12
Amendment	: **1**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53275	Issue Date	: 20-Jun-2023
Sampler	: [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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Accredited for compliance with
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5107530)									
EP2307498-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	119	134	12.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	119	134	12.1	0% - 20%
EP2307498-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	169	189	10.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	169	189	10.7	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5107533)									
EP2307500-009	0089_MW126_230607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	559	560	0.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	559	560	0.2	0% - 20%
EP2307502-010	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	125	124	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5104231)									
EP2307491-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3	4	0.0	No Limit
EP2307500-006	0089_MW288_230607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	31	29	5.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5104232)									
EP2307491-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	39	40	2.7	0% - 20%
EP2307500-006	0089_MW288_230607	ED045G: Chloride	16887-00-6	1	mg/L	71	69	2.2	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5105907)									
EP2307498-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	513	474	7.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1220	1210	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10500	10600	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	389	387	0.6	0% - 20%
EP2307502-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	480	484	1.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1260	1290	2.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11000	11100	1.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	368	377	2.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5105909)									
EP2307493-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	429	425	0.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1240	1240	0.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12400	12400	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	456	454	0.6	0% - 20%
EP2307500-008	0089_MW125_230607	ED093F: Calcium	7440-70-2	1	mg/L	434	422	2.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	993	961	3.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	9640	9210	4.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	332	323	3.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107841)									
EP2307500-001	0089_MW245_230607	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107843)									
EP2307500-010	0089_MW127_230607	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2307502-015	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107841)									
EP2307500-001	0089_MW245_230607	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107841) - continued									
EP2307500-001	0089_MW245_230607	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.3	<0.3	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107843)									
EP2307500-010	0089_MW127_230607	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2307502-015	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107841)									
EP2307500-001	0089_MW245_230607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107841) - continued									
EP2307500-001	0089_MW245_230607	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107843)									
EP2307500-010	0089_MW127_230607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2307502-015	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107841)									
EP2307500-001	0089_MW245_230607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107841) - continued									
EP2307500-001	0089_MW245_230607	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107843)									
EP2307500-010	0089_MW127_230607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2307502-015	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107841)									
EP2307500-001	0089_MW245_230607	EP231X: Sum of PFAS	----	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.05	0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107843)									
EP2307500-010	0089_MW127_230607	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2307502-015	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5107530)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	98.6	87.8	118
				<1	200 mg/L	98.8	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 5107533)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	103	87.8	118
				<1	200 mg/L	102	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104231)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	89.9	112
				<1	500 mg/L	104	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5104232)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	107	88.6	113
				<1	1000 mg/L	99.2	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5105907)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	95.0	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5105909)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	88.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.0	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107841)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	112	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107841) - continued								
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	118	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	99.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	95.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107843)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	105	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	120	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	92.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	125	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	101	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	97.1	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107841)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	112	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	93.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	99.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	89.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	105	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	99.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	91.8	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107843)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	111	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	98.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	106	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	92.6	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107843) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	96.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107841)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	94.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	86.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	99.5	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	101	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	90.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	115	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107843)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	95.6	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	102	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107841)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	114	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	114	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	114	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	110	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107843)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	126	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	113	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	99.8	64.2	133

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5107841)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5107843)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104231)							
EP2307491-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	115	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5104232)							
EP2307491-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	99.5	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107841)							
EP2307500-008	0089_MW125_230607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.9	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	92.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	75.5	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	106	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	99.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	107	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107843)							
EP2307502-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	110	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	114	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	89.3	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	112	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	105	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	95.4	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107841)							
EP2307500-008	0089_MW125_230607	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	112	73.0	142

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107841) - continued							
EP2307500-008	0089_MW125_230607	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	103	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	83.9	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	90.3	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	110	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	92.7	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	99.2	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	99.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	97.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	102	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	94.4	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107843)							
EP2307502-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	112	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	109	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	98.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	113	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	104	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	108	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	116	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	110	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	94.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	99.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107841)							
EP2307500-008	0089_MW125_230607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	90.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	84.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	114	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	119	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	97.9	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107843)							
EP2307502-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	119	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107843) - continued							
EP2307502-006	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	104	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	101	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	119	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	106	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107841)							
EP2307500-008	0089_MW125_230607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	123	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	113	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	103	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	97.3	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107843)							
EP2307502-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	116	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	123	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	118	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	113	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307500**	Page	: 1 of 5
Amendment	: **1**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling GW - CG	Issue Date	: 20-Jun-2023
Sampler	: [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	3	40	7.50	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW245_230607, 0089_MW243_230607, 0089_MW239_230607, 0089_MW240_230607, 0089_MW238_230607, 0089_MW288_230607, 0089_MW124_230607, 0089_MW125_230607, 0089_MW126_230607, 0089_MW127_230607	**07-Jun-2023**	**----**	----	**----**	**13-Jun-2023**	21-Jun-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW245_230607, 0089_MW243_230607, 0089_MW239_230607, 0089_MW240_230607, 0089_MW238_230607, 0089_MW288_230607, 0089_MW124_230607, 0089_MW125_230607, 0089_MW126_230607, 0089_MW127_230607	**07-Jun-2023**	**----**	----	**----**	**19-Jun-2023**	05-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW245_230607, 0089_MW243_230607, 0089_MW239_230607, 0089_MW240_230607, 0089_MW238_230607, 0089_MW288_230607, 0089_MW124_230607, 0089_MW125_230607, 0089_MW126_230607, 0089_MW127_230607	**07-Jun-2023**	**----**	----	**----**	**19-Jun-2023**	05-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW245_230607, 0089_MW243_230607, 0089_MW239_230607, 0089_MW240_230607, 0089_MW238_230607, 0089_MW288_230607, 0089_MW124_230607, 0089_MW125_230607, 0089_MW126_230607, 0089_MW127_230607	**07-Jun-2023**	**----**	----	**----**	**14-Jun-2023**	14-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW245_230607, 0089_MW243_230607, 0089_MW239_230607, 0089_MW240_230607, 0089_MW238_230607, 0089_MW288_230607, 0089_MW124_230607, 0089_MW125_230607, 0089_MW126_230607, 0089_MW127_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW245_230607, 0089_MW243_230607, 0089_MW239_230607, 0089_MW240_230607, 0089_MW238_230607, 0089_MW288_230607, 0089_MW124_230607, 0089_MW125_230607, 0089_MW126_230607, 0089_MW127_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW245_230607, 0089_MW243_230607, 0089_MW239_230607, 0089_MW240_230607, 0089_MW238_230607, 0089_MW288_230607, 0089_MW124_230607, 0089_MW125_230607, 0089_MW126_230607, 0089_MW127_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW245_230607, 0089_MW243_230607, 0089_MW239_230607, 0089_MW240_230607, 0089_MW238_230607, 0089_MW288_230607, 0089_MW124_230607, 0089_MW125_230607, 0089_MW126_230607, 0089_MW127_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW245_230607, 0089_MW243_230607, 0089_MW239_230607, 0089_MW240_230607, 0089_MW238_230607, 0089_MW288_230607, 0089_MW124_230607, 0089_MW125_230607, 0089_MW126_230607, 0089_MW127_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	40	**7.50**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 53282 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 8/6 12:40	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD346		07/06/2023 09:43 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD368		07/06/2023 10:46 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD304		07/06/2023 10:46 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD364		07/06/2023 12:03 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD335		07/06/2023 12:04 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_QC117		07/06/2023 12:04 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD363		07/06/2023 12:51 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
008	0089_SD341		07/06/2023 12:52 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
009	0089_SD340		07/06/2023 12:52 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

Environmental Division
Perth

Work Order Reference
EP2307501

Telephone : +61-8-9406 1301

CHAIN OF CUSTODY

(ALS) COC#: 53282 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SD362		07/06/2023 12:52 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 53282 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD346	HDPE Soil Jar	200 mL	00621122035221	Grey	No	
002	0089_SD368	HDPE Soil Jar	200 mL	00621122035210	Grey	No	
003	0089_SD304	HDPE Soil Jar	200 mL	00621122035202	Grey	No	
004	0089_SD364	HDPE Soil Jar	200 mL	00621122035197	Grey	No	
005	0089_SD335	HDPE Soil Jar	200 mL	00621122035201	Grey	No	
006	0089_QC117	HDPE Soil Jar	200 mL	00621122035169	Grey	No	
007	0089_SD363	HDPE Soil Jar	200 mL	00621122035170	Grey	No	
008	0089_SD341	HDPE Soil Jar	200 mL	00621122035222	Grey	No	
009	0089_SD340	HDPE Soil Jar	200 mL	00621122035209	Grey	No	
010	0089_SD362	HDPE Soil Jar	200 mL	00621122035220	Grey	No	

Total Bottle Count: ALS: 10, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307501**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53282	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 12:40	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 16-Jun-2023	Scheduled Reporting Date	: **16-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2307501-001	07-Jun-2023 09:43	0089_SD346_230607	✓	✓
EP2307501-002	07-Jun-2023 10:46	0089_SD368_230607	✓	✓
EP2307501-003	07-Jun-2023 10:46	0089_SD304_230607	✓	✓
EP2307501-004	07-Jun-2023 12:03	0089_SD364_230607	✓	✓
EP2307501-005	07-Jun-2023 12:04	0089_SD335_230607	✓	✓
EP2307501-006	07-Jun-2023 12:04	0089_QC117_230607	✓	✓
EP2307501-007	07-Jun-2023 12:51	0089_SD363_230607	✓	✓
EP2307501-008	07-Jun-2023 12:52	0089_SD341_230607	✓	✓
EP2307501-009	07-Jun-2023 12:52	0089_SD340_230607	✓	✓
EP2307501-010	07-Jun-2023 12:52	0089_SD362_230607	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307501**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 12:40
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53282	Issue Date	: 16-Jun-2023 11:27
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD346_230607	0089_SD368_230607	0089_SD304_230607	0089_SD364_230607	0089_SD335_230607
				Sampling date / time	07-Jun-2023 09:43	07-Jun-2023 10:46	07-Jun-2023 10:46	07-Jun-2023 12:03	07-Jun-2023 12:04
Compound	CAS Number	LOR	Unit		EP2307501-001	EP2307501-002	EP2307501-003	EP2307501-004	EP2307501-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**30.6**	**29.0**	**29.6**	**27.3**	**22.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0009**	**0.0003**	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD346_230607	0089_SD368_230607	0089_SD304_230607	0089_SD364_230607	0089_SD335_230607
				Sampling date / time	07-Jun-2023 09:43	07-Jun-2023 10:46	07-Jun-2023 10:46	07-Jun-2023 12:03	07-Jun-2023 12:04
Compound	CAS Number	LOR	Unit		EP2307501-001	EP2307501-002	EP2307501-003	EP2307501-004	EP2307501-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0009**	**0.0003**	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0009**	**0.0003**	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0009**	**0.0003**	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**108**	**108**	**94.5**	**99.0**	**127**
13C8-PFOA	----	0.0002	%		**88.5**	**91.5**	**102**	**92.5**	**126**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_QC117_230607	0089_SD363_230607	0089_SD341_230607	0089_SD340_230607	0089_SD362_230607
				Sampling date / time	07-Jun-2023 12:04	07-Jun-2023 12:51	07-Jun-2023 12:52	07-Jun-2023 12:52	07-Jun-2023 12:52
Compound	CAS Number	LOR	Unit		EP2307501-006	EP2307501-007	EP2307501-008	EP2307501-009	EP2307501-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**25.7**	**28.7**	**28.2**	**34.5**	**31.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_QC117_230607	0089_SD363_230607	0089_SD341_230607	0089_SD340_230607	0089_SD362_230607
				Sampling date / time	07-Jun-2023 12:04	07-Jun-2023 12:51	07-Jun-2023 12:52	07-Jun-2023 12:52	07-Jun-2023 12:52
Compound	CAS Number	LOR	Unit		EP2307501-006	EP2307501-007	EP2307501-008	EP2307501-009	EP2307501-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**106**	**97.0**	**112**	**113**	**106**
13C8-PFOA	----	0.0002	%		**104**	**94.5**	**95.5**	**94.5**	**95.5**

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2307501**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53282	Issue Date	: 16-Jun-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5105956)									
EP2307501-001	0089_SD346_230607	EA055: Moisture Content	----	0.1	%	30.6	30.5	0.4	0% - 20%
EP2307501-010	0089_SD362_230607	EA055: Moisture Content	----	0.1	%	31.8	32.7	2.6	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107138)									
EP2307499-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2307501-004	0089_SD364_230607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107138)									
EP2307499-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107138) - continued									
EP2307499-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2307501-004	0089_SD364_230607	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107138)									
EP2307499-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307501-004	0089_SD364_230607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107138)									
EP2307499-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307501-004	0089_SD364_230607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107138)									
EP2307499-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2307501-004	0089_SD364_230607	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107138)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	101	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	96.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	88.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	106	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	83.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107138)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	102	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	115	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107138)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107138)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107138) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	98.3	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	88.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	115	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	77.9	54.8	124
EP231P: PFAS Sums (QCLot: 5107138)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107138)							
EP2307499-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	93.7	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	84.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	89.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	90.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	100	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	86.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107138)							
EP2307499-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	103	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	100	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	99.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	104	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	105	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	104	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	88.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	105	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	98.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	83.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	116	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107138)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107138) - continued							
EP2307499-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	90.4	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	125	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	115	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	114	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	103	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	85.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	61.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107138)							
EP2307499-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	95.7	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	112	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	123	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	68.1	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307501**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling SD - CG	Issue Date	: 16-Jun-2023
Sampler	: [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD346_230607,	0089_SD368_230607,	**07-Jun-2023**	**----**	----	----	**13-Jun-2023**	21-Jun-2023	✓
0089_SD304_230607,	0089_SD364_230607,							
0089_SD335_230607,	0089_QC117_230607,							
0089_SD363_230607,	0089_SD341_230607,							
0089_SD340_230607,	0089_SD362_230607							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD346_230607,	0089_SD368_230607,	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
0089_SD304_230607,	0089_SD364_230607,							
0089_SD335_230607,	0089_QC117_230607,							
0089_SD363_230607,	0089_SD341_230607,							
0089_SD340_230607,	0089_SD362_230607							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD346_230607,	0089_SD368_230607,	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
0089_SD304_230607,	0089_SD364_230607,							
0089_SD335_230607,	0089_QC117_230607,							
0089_SD363_230607,	0089_SD341_230607,							
0089_SD340_230607,	0089_SD362_230607							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD346_230607,	0089_SD368_230607,	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
0089_SD304_230607,	0089_SD364_230607,							
0089_SD335_230607,	0089_QC117_230607,							
0089_SD363_230607,	0089_SD341_230607,							
0089_SD340_230607,	0089_SD362_230607							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD346_230607,	0089_SD368_230607,	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
0089_SD304_230607,	0089_SD364_230607,							
0089_SD335_230607,	0089_QC117_230607,							
0089_SD363_230607,	0089_SD341_230607,							
0089_SD340_230607,	0089_SD362_230607							
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD346_230607,	0089_SD368_230607,	**07-Jun-2023**	**13-Jun-2023**	04-Dec-2023	✓	**15-Jun-2023**	23-Jul-2023	✓
0089_SD304_230607,	0089_SD364_230607,							
0089_SD335_230607,	0089_QC117_230607,							
0089_SD363_230607,	0089_SD341_230607,							
0089_SD340_230607,	0089_SD362_230607							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 53283 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 12:40 8/6	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW346		07/06/2023 09:46 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_SW373		07/06/2023 09:47 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_SW372		07/06/2023 09:48 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW368		07/06/2023 10:41 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW304		07/06/2023 10:43 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_SW305		07/06/2023 10:44 AM	WATER	ALS: 5 Non ALS: 0	No	X		
007	0089_SW371		07/06/2023 10:45 AM	WATER	ALS: 3 Non ALS: 0	No	X		
008	0089_PW364		07/06/2023 12:05 PM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_QC118		07/06/2023 12:08 PM	WATER	ALS: 2 Non ALS: 0	No	Partial 1/2		

Environmental Division Perth

Work Order Reference

EP2307502

Telephone - 61-8-9406 1301

CHAIN OF CUSTODY

(ALS) COC#: 53283 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free Ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SW130		07/06/2023 12:24 PM	WATER	ALS: 5 Non ALS: 0	No	X		
011	0089_PW335		07/06/2023 12:26 PM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_SW134		07/06/2023 01:10 PM	WATER	ALS: 2 Non ALS: 1	No	X		
013	0089_PW340		07/06/2023 01:12 PM	WATER	ALS: 3 Non ALS: 0	No	X		
014	0089_PW341		07/06/2023 01:13 PM	WATER	ALS: 3 Non ALS: 0	No	X		
015	0089_SW132		07/06/2023 01:15 PM	WATER	ALS: 5 Non ALS: 0	No	X		
016	0089_PW363		07/06/2023 01:16 PM	WATER	ALS: 5 Non ALS: 0	No	X		
017	0089_PW362		07/06/2023 01:18 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 53283 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
009	0089_QC118	WA OMP Water Suite WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 53283 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW346	Clear Plastic Bottle - Natural	125 mL	00070522067432	Green	No	
001	0089_PW346	HDPE (no PTFE)	20 mL	00350822082722	Grey	No	
001	0089_PW346	HDPE (no PTFE)	20 mL	00350822082883	Grey	No	
002	0089_SW373	Clear Plastic Bottle - Natural	125 mL	00070522054862	Green	No	
002	0089_SW373	HDPE (no PTFE)	20 mL	00350822082456	Grey	No	
002	0089_SW373	HDPE (no PTFE)	20 mL	00350822082334	Grey	No	
003	0089_SW372	Clear Plastic Bottle - Natural	125 mL	00070522054790	Green	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00350822082473	Grey	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00350822082608	Grey	No	
004	0089_PW368	HDPE (no PTFE)	20 mL	00350822082767	Grey	No	
004	0089_PW368	HDPE (no PTFE)	20 mL	00350822082628	Grey	No	
004	0089_PW368	Clear Plastic Bottle - Natural	125 mL	00070522054722	Green	No	
005	0089_PW304	HDPE (no PTFE)	20 mL	00350821008274	Grey	No	
005	0089_PW304	Clear Plastic Bottle - Natural	125 mL	00070522189241	Green	No	
005	0089_PW304	HDPE (no PTFE)	20 mL	00350821008370	Grey	No	
006	0089_SW305	Clear Plastic Bottle - Natural	125 mL	00070522189253	Green	No	
006	0089_SW305	HDPE (no PTFE)	20 mL	00350822082579	Grey	No	
006	0089_SW305	HDPE (no PTFE)	20 mL	00350822082553	Grey	No	
006	0089_SW305	HDPE (no PTFE)	20 mL	00350821008515	Grey	No	
007	0089_SW371	Clear Plastic Bottle - Natural	20 mL	00350821008522	Grey	No	
007	0089_SW371	HDPE (no PTFE)	125 mL	00070522054810	Green	No	
007	0089_SW371	HDPE (no PTFE)	20 mL	00350822082478	Grey	No	
008	0089_PW364	Clear Plastic Bottle - Natural	20 mL	00350822082428	Grey	No	
008	0089_PW364	HDPE (no PTFE)	125 mL	00070522054773	Green	No	
008	0089_PW364	HDPE (no PTFE)	20 mL	00350822082571	Grey	No	
			20 mL	00350822082489	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 53283 · ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_QC118	HDPE (no PTFE)	20 mL	00350822082505	Grey	No	
009	0089_QC118	HDPE (no PTFE)	20 mL	00350822082469	Grey	No	
010	0089_SW130	HDPE (no PTFE)	20 mL	00350822082564	Grey	No	
010	0089_SW130	HDPE (no PTFE)	20 mL	00350822082318	Grey	No	
010	0089_SW130	Clear Plastic Bottle - Natural	125 mL	00070522054715	Green	No	
010	0089_SW130	HDPE (no PTFE)	20 mL	00350822082362	Grey	No	
010	0089_SW130	HDPE (no PTFE)	20 mL	00350822082464	Grey	No	
011	0089_PW335	Clear Plastic Bottle - Natural	125 mL	00070522054775	Green	No	
011	0089_PW335	HDPE (no PTFE)	20 mL	00350822082543	Grey	No	
011	0089_PW335	HDPE (no PTFE)	20 mL	00350822082463	Grey	No	
012	0089_SW134	HDPE (no PTFE)	20 mL	00350822082490	Grey	No	
012	0089_SW134	HDPE (no PTFE)	20 mL	00350822082355	Grey	No	
013	0089_PW340	Clear Plastic Bottle - Natural	125 mL	00070822077310	Green	No	
013	0089_PW340	HDPE (no PTFE)	20 mL	00350822082601	Grey	No	
013	0089_PW340	HDPE (no PTFE)	20 mL	00350822082562	Grey	No	
014	0089_PW341	Clear Plastic Bottle - Natural	125 mL	00070621200504	Green	No	
014	0089_PW341	HDPE (no PTFE)	20 mL	00352101061584	Grey	No	
014	0089_PW341	HDPE (no PTFE)	20 mL	00352101061767	Grey	No	
015	0089_SW132	HDPE (no PTFE)	20 mL	00350822082424	Grey	No	
015	0089_SW132	HDPE (no PTFE)	20 mL	00350822082512	Grey	No	
015	0089_SW132	Clear Plastic Bottle - Natural	125 mL	00070822077317	Green	No	
015	0089_SW132	HDPE (no PTFE)	20 mL	00350822082529	Grey	No	
015	0089_SW132	HDPE (no PTFE)	20 mL	00350822082367	Grey	No	
016	0089_PW363	HDPE (no PTFE)	20 mL	00350822082547	Grey	No	
016	0089_PW363	HDPE (no PTFE)	20 mL	00350822082607	Grey	No	
016	0089_PW363	Clear Plastic Bottle - Natural	125 mL	00070522054786	Green	No	
016	0089_PW363	HDPE (no PTFE)	20 mL	00350822082581	Grey	No	

CHAIN OF CUSTODY

COC#: 53283 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted]

/ ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

016	0089_PW363	HDPE (no PTFE)	20 mL	00350822082523	Grey	No	
017	0089_PW362	Clear Plastic Bottle - Natural	125 mL	00070621061598	Green	No	
017	0089_PW362	HDPE (no PTFE)	20 mL	00350621043731	Grey	No	
017	0089_PW362	HDPE (no PTFE)	20 mL	00350621043742	Grey	No	

Total Bottle Count: ALS: 57, Non ALS: 1

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307502**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53283	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 12:40	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 19-Jun-2023	Scheduled Reporting Date	: **19-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 17 / 17

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307502-001	07-Jun-2023 09:46	0089_PW346_230607	✓	✓
EP2307502-002	07-Jun-2023 09:47	0089_SW373_230607	✓	✓
EP2307502-003	07-Jun-2023 09:48	0089_SW372_230607	✓	✓
EP2307502-004	07-Jun-2023 10:41	0089_PW368_230607	✓	✓
EP2307502-005	07-Jun-2023 10:43	0089_PW304_230607	✓	✓
EP2307502-006	07-Jun-2023 10:44	0089_SW305_230607	✓	✓
EP2307502-007	07-Jun-2023 10:45	0089_SW371_230607	✓	✓
EP2307502-008	07-Jun-2023 12:05	0089_PW364_230607	✓	✓
EP2307502-009	07-Jun-2023 12:08	0089_QC118_230607	✓	
EP2307502-010	07-Jun-2023 12:24	0089_SW130_230607	✓	✓
EP2307502-011	07-Jun-2023 12:26	0089_PW335_230607	✓	✓
EP2307502-012	07-Jun-2023 13:10	0089_SW134_230607	✓	✓
EP2307502-013	07-Jun-2023 13:12	0089_PW340_230607	✓	✓
EP2307502-014	07-Jun-2023 13:13	0089_PW341_230607	✓	✓
EP2307502-015	07-Jun-2023 13:15	0089_SW132_230607	✓	✓
EP2307502-016	07-Jun-2023 13:16	0089_PW363_230607	✓	✓
EP2307502-017	07-Jun-2023 13:18	0089_PW362_230607	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]

DERP LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307502**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 12:40
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53283	Issue Date	: 20-Jun-2023 16:13
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 17		
No. of samples analysed	: 17		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW335_230607	0089_PW340_230607	0089_PW341_230607	0089_PW363_230607	0089_PW362_230607
				Sampling date / time	07-Jun-2023 12:26	07-Jun-2023 13:12	07-Jun-2023 13:13	07-Jun-2023 13:16	07-Jun-2023 13:18
Compound	CAS Number	LOR	Unit		EP2307502-011	EP2307502-013	EP2307502-014	EP2307502-016	EP2307502-017
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**168**	**152**	**167**	**126**	**152**
Total Alkalinity as CaCO3	----	1	mg/L		**168**	**152**	**167**	**126**	**152**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2520**	**2430**	**2200**	**2700**	**2400**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17900**	**16900**	**15200**	**19400**	**17400**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**439**	**443**	**375**	**496**	**466**
Magnesium	7439-95-4	1	mg/L		**1170**	**1110**	**1000**	**1300**	**1180**
Sodium	7440-23-5	1	mg/L		**10200**	**9590**	**8770**	**11200**	**10100**
Potassium	7440-09-7	1	mg/L		**350**	**330**	**315**	**384**	**340**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**561**	**530**	**478**	**606**	**544**
ø Total Cations	----	0.01	meq/L		**571**	**539**	**490**	**629**	**568**
ø Ionic Balance	----	0.01	%		**0.89**	**0.81**	**1.30**	**1.84**	**2.21**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.03**	**0.02**	**0.01**	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW335_230607	0089_PW340_230607	0089_PW341_230607	0089_PW363_230607	0089_PW362_230607
				Sampling date / time	07-Jun-2023 12:26	07-Jun-2023 13:12	07-Jun-2023 13:13	07-Jun-2023 13:16	07-Jun-2023 13:18
Compound	CAS Number	LOR	Unit		EP2307502-011	EP2307502-013	EP2307502-014	EP2307502-016	EP2307502-017
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW335_230607	0089_PW340_230607	0089_PW341_230607	0089_PW363_230607	0089_PW362_230607
				Sampling date / time	07-Jun-2023 12:26	07-Jun-2023 13:12	07-Jun-2023 13:13	07-Jun-2023 13:16	07-Jun-2023 13:18
Compound	CAS Number	LOR	Unit		EP2307502-011	EP2307502-013	EP2307502-014	EP2307502-016	EP2307502-017
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.03**	**0.02**	**0.01**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.03**	**0.02**	**0.01**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.03**	**0.02**	**0.01**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**108**	**103**	**112**	**96.5**	**109**
13C8-PFOA	----	0.02	%		**98.3**	**103**	**106**	**103**	**107**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW346_230607	0089_SW373_230607	0089_SW372_230607	0089_PW368_230607	0089_PW304_230607
				Sampling date / time	07-Jun-2023 09:46	07-Jun-2023 09:47	07-Jun-2023 09:48	07-Jun-2023 10:41	07-Jun-2023 10:43
Compound	CAS Number	LOR	Unit		EP2307502-001	EP2307502-002	EP2307502-003	EP2307502-004	EP2307502-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**327**	**157**	**138**	**198**	**181**
Total Alkalinity as CaCO3	----	1	mg/L		**327**	**157**	**138**	**198**	**181**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2360**	**2680**	**2650**	**2460**	**2200**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17300**	**19300**	**18800**	**17800**	**15700**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**522**	**480**	**473**	**467**	**429**
Magnesium	7439-95-4	1	mg/L		**1150**	**1260**	**1260**	**1180**	**1050**
Sodium	7440-23-5	1	mg/L		**9860**	**11000**	**10700**	**10000**	**8940**
Potassium	7440-09-7	1	mg/L		**333**	**368**	**367**	**344**	**315**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**544**	**603**	**588**	**557**	**492**
ø Total Cations	----	0.01	meq/L		**558**	**616**	**602**	**564**	**505**
ø Ionic Balance	----	0.01	%		**1.31**	**1.00**	**1.16**	**0.62**	**1.25**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.04**	**0.02**	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.55**	**0.28**	**0.08**	**0.15**	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW346_230607	0089_SW373_230607	0089_SW372_230607	0089_PW368_230607	0089_PW304_230607
				Sampling date / time	07-Jun-2023 09:46	07-Jun-2023 09:47	07-Jun-2023 09:48	07-Jun-2023 10:41	07-Jun-2023 10:43
Compound	CAS Number	LOR	Unit		EP2307502-001	EP2307502-002	EP2307502-003	EP2307502-004	EP2307502-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW346_230607	0089_SW373_230607	0089_SW372_230607	0089_PW368_230607	0089_PW304_230607
				Sampling date / time	07-Jun-2023 09:46	07-Jun-2023 09:47	07-Jun-2023 09:48	07-Jun-2023 10:41	07-Jun-2023 10:43
Compound	CAS Number	LOR	Unit		EP2307502-001	EP2307502-002	EP2307502-003	EP2307502-004	EP2307502-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.59**	**0.30**	**0.08**	**0.15**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.59**	**0.30**	**0.08**	**0.15**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.59**	**0.30**	**0.08**	**0.15**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.8**	**99.5**	**106**	**97.9**	**100**
13C8-PFOA	----	0.02	%		**103**	**104**	**96.8**	**105**	**96.7**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW305_230607	0089_SW371_230607	0089_PW364_230607	0089_QC118_230607	0089_SW130_230607
				Sampling date / time	07-Jun-2023 10:44	07-Jun-2023 10:45	07-Jun-2023 12:05	07-Jun-2023 12:08	07-Jun-2023 12:24
Compound	CAS Number	LOR	Unit		EP2307502-006	EP2307502-007	EP2307502-008	EP2307502-009	EP2307502-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**143**	**131**	**144**	----	**125**
Total Alkalinity as CaCO3	----	1	mg/L		**143**	**131**	**144**	----	**125**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2610**	**2670**	**2630**	----	**2710**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19100**	**19000**	**19100**	----	**19500**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**517**	**464**	**490**	----	**461**
Magnesium	7439-95-4	1	mg/L		**1310**	**1200**	**1220**	----	**1260**
Sodium	7440-23-5	1	mg/L		**11300**	**10200**	**10500**	----	**11000**
Potassium	7440-09-7	1	mg/L		**382**	**360**	**372**	----	**370**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**596**	**594**	**596**	----	**609**
ø Total Cations	----	0.01	meq/L		**635**	**575**	**591**	----	**615**
ø Ionic Balance	----	0.01	%		**3.16**	**1.66**	**0.45**	----	**0.46**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.03**	**0.06**	**0.02**	**0.02**	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW305_230607	0089_SW371_230607	0089_PW364_230607	0089_QC118_230607	0089_SW130_230607
				Sampling date / time	07-Jun-2023 10:44	07-Jun-2023 10:45	07-Jun-2023 12:05	07-Jun-2023 12:08	07-Jun-2023 12:24
Compound	CAS Number	LOR	Unit		EP2307502-006	EP2307502-007	EP2307502-008	EP2307502-009	EP2307502-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW305_230607	0089_SW371_230607	0089_PW364_230607	0089_QC118_230607	0089_SW130_230607
				Sampling date / time	07-Jun-2023 10:44	07-Jun-2023 10:45	07-Jun-2023 12:05	07-Jun-2023 12:08	07-Jun-2023 12:24
Compound	CAS Number	LOR	Unit		EP2307502-006	EP2307502-007	EP2307502-008	EP2307502-009	EP2307502-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.03**	**0.06**	**0.02**	**0.02**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.03**	**0.06**	**0.02**	**0.02**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	**0.06**	**0.02**	**0.02**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**106**	**92.5**	**110**	**105**
13C8-PFOA	----	0.02	%		**107**	**98.5**	**97.3**	**97.9**	**104**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW134_230607	0089_SW132_230607	----	----	----
				Sampling date / time	07-Jun-2023 13:10	07-Jun-2023 13:15	----	----	----
Compound	CAS Number	LOR	Unit		EP2307502-012	EP2307502-015	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**124**	**125**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**124**	**125**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2740**	**2780**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19500**	**19600**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**476**	**476**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1290**	**1260**	----	----	----
Sodium	7440-23-5	1	mg/L		**11100**	**11000**	----	----	----
Potassium	7440-09-7	1	mg/L		**379**	**373**	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**610**	**613**	----	----	----
ø **Total Cations**	----	0.01	meq/L		**622**	**615**	----	----	----
ø **Ionic Balance**	----	0.01	%		**1.04**	**0.18**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW134_230607	0089_SW132_230607	----	----	----
				Sampling date / time	07-Jun-2023 13:10	07-Jun-2023 13:15	----	----	----
Compound	CAS Number	LOR	Unit		EP2307502-012	EP2307502-015	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW134_230607	0089_SW132_230607	----	----	----
				Sampling date / time	07-Jun-2023 13:10	07-Jun-2023 13:15	----	----	----
Compound	CAS Number	LOR	Unit		EP2307502-012	EP2307502-015	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**96.2**	----	----	----
13C8-PFOA	----	0.02	%		**101**	**96.5**	----	----	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307502**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53283	Issue Date	: 20-Jun-2023
Sampler	: [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 17		
No. of samples analysed	: 17		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5107533)									
EP2307500-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	559	560	0.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	559	560	0.2	0% - 20%
EP2307502-010	0089_SW130_230607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	125	124	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5106121)									
EP2307502-001	0089_PW346_230607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2360	2340	0.6	0% - 20%
EP2307502-012	0089_SW134_230607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2740	2780	1.3	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5106122)									
EP2307502-001	0089_PW346_230607	ED045G: Chloride	16887-00-6	1	mg/L	17300	17300	0.3	0% - 20%
EP2307502-012	0089_SW134_230607	ED045G: Chloride	16887-00-6	1	mg/L	19500	19300	0.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5105907)									
EP2307498-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	513	474	7.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1220	1210	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10500	10600	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	389	387	0.6	0% - 20%
EP2307502-002	0089_SW373_230607	ED093F: Calcium	7440-70-2	1	mg/L	480	484	1.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1260	1290	2.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11000	11100	1.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	368	377	2.3	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5105909)									
EP2307493-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	429	425	0.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1240	1240	0.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12400	12400	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	456	454	0.6	0% - 20%
EP2307500-008	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	434	422	2.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	993	961	3.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	9640	9210	4.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	332	323	3.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5105910)									
EP2307502-017	0089_PW362_230607	ED093F: Calcium	7440-70-2	1	mg/L	466	445	4.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1180	1170	1.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10100	10100	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	340	341	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107843)									
EP2307500-010	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2307502-015	0089_SW132_230607	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107843)									
EP2307500-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2307502-015	0089_SW132_230607	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107843) - continued									
EP2307502-015	0089_SW132_230607	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107843)									
EP2307500-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2307502-015	0089_SW132_230607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107843)									
EP2307500-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107843) - continued									
EP2307500-010	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2307502-015	0089_SW132_230607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107843)									
EP2307500-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2307502-015	0089_SW132_230607	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5107533)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	103	87.8	118
				<1	200 mg/L	102	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5106121)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.5	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5106122)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	108	88.6	113
				<1	1000 mg/L	97.3	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5105907)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	95.0	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5105909)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	88.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.0	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.4	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5105910)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.4	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	89.0	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	95.0	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107843)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	105	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	120	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	92.7	68.0	131

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107843) - continued								
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	125	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	101	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	97.1	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107843)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	111	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	98.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	106	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	92.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	96.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107843)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	95.6	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	102	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107843)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	126	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	113	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	99.8	64.2	133
EP231P: PFAS Sums (QCLot: 5107843)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5107843) - continued								
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5106121)							
EP2307502-001	0089_PW346_230607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5106122)							
EP2307502-001	0089_PW346_230607	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107843)							
EP2307502-006	0089_SW305_230607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	110	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	114	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	89.3	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	112	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	105	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	95.4	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107843)							
EP2307502-006	0089_SW305_230607	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	112	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	109	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	98.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	113	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	104	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	108	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	116	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	110	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	94.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	99.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107843)							
EP2307502-006	0089_SW305_230607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	119	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107843) - continued							
EP2307502-006	0089_SW305_230607	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	104	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	101	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	119	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	106	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107843)							
EP2307502-006	0089_SW305_230607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	116	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	123	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	118	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	113	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307502**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling SW/PW - CG	Issue Date	: 20-Jun-2023
Sampler	: [redacted]	No. of samples received	: 17
Order number	: pfas-omp/Stirling	No. of samples analysed	: 17

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2307502--001	0089_PW346_230607	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2307502--001	0089_PW346_230607	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW346_230607,	0089_SW373_230607,	**07-Jun-2023**	**----**	----	**----**	**13-Jun-2023**	21-Jun-2023	✓
0089_SW372_230607,	0089_PW368_230607,							
0089_PW304_230607,	0089_SW305_230607,							
0089_SW371_230607,	0089_PW364_230607,							
0089_SW130_230607,	0089_PW335_230607,							
0089_SW134_230607,	0089_PW340_230607,							
0089_PW341_230607,	0089_SW132_230607,							
0089_PW363_230607,	0089_PW362_230607							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_PW346_230607,	0089_SW373_230607,	**07-Jun-2023**	**----**	----	**----**	**19-Jun-2023**	05-Jul-2023	✓
0089_SW372_230607,	0089_PW368_230607,							
0089_PW304_230607,	0089_SW305_230607,							
0089_SW371_230607,	0089_PW364_230607,							
0089_SW130_230607,	0089_PW335_230607,							
0089_SW134_230607,	0089_PW340_230607,							
0089_PW341_230607,	0089_SW132_230607,							
0089_PW363_230607,	0089_PW362_230607							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW346_230607, 0089_SW373_230607, 0089_SW372_230607, 0089_PW368_230607, 0089_PW304_230607, 0089_SW305_230607, 0089_SW371_230607, 0089_PW364_230607, 0089_SW130_230607, 0089_PW335_230607, 0089_SW134_230607, 0089_PW340_230607, 0089_PW341_230607, 0089_SW132_230607, 0089_PW363_230607, 0089_PW362_230607	**07-Jun-2023**	**----**	----	----	**19-Jun-2023**	05-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW346_230607, 0089_SW373_230607, 0089_SW372_230607, 0089_PW368_230607, 0089_PW304_230607, 0089_SW305_230607, 0089_SW371_230607, 0089_PW364_230607, 0089_SW130_230607, 0089_PW335_230607, 0089_SW134_230607, 0089_PW340_230607, 0089_PW341_230607, 0089_SW132_230607, 0089_PW363_230607, 0089_PW362_230607	**07-Jun-2023**	**----**	----	----	**14-Jun-2023**	14-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW346_230607, 0089_SW373_230607, 0089_SW372_230607, 0089_PW368_230607, 0089_PW304_230607, 0089_SW305_230607, 0089_SW371_230607, 0089_PW364_230607, 0089_QC118_230607, 0089_SW130_230607, 0089_PW335_230607, 0089_SW134_230607, 0089_PW340_230607, 0089_PW341_230607, 0089_SW132_230607, 0089_PW363_230607, 0089_PW362_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW346_230607, 0089_SW373_230607, 0089_SW372_230607, 0089_PW368_230607, 0089_PW304_230607, 0089_SW305_230607, 0089_SW371_230607, 0089_PW364_230607, 0089_QC118_230607, 0089_SW130_230607, 0089_PW335_230607, 0089_SW134_230607, 0089_PW340_230607, 0089_PW341_230607, 0089_SW132_230607, 0089_PW363_230607, 0089_PW362_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW346_230607, 0089_SW373_230607, 0089_SW372_230607, 0089_PW368_230607, 0089_PW304_230607, 0089_SW305_230607, 0089_SW371_230607, 0089_PW364_230607, 0089_QC118_230607, 0089_SW130_230607, 0089_PW335_230607, 0089_SW134_230607, 0089_PW340_230607, 0089_PW341_230607, 0089_SW132_230607, 0089_PW363_230607, 0089_PW362_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW346_230607, 0089_SW373_230607, 0089_SW372_230607, 0089_PW368_230607, 0089_PW304_230607, 0089_SW305_230607, 0089_SW371_230607, 0089_PW364_230607, 0089_QC118_230607, 0089_SW130_230607, 0089_PW335_230607, 0089_SW134_230607, 0089_PW340_230607, 0089_PW341_230607, 0089_SW132_230607, 0089_PW363_230607, 0089_PW362_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW346_230607, 0089_SW373_230607, 0089_SW372_230607, 0089_PW368_230607, 0089_PW304_230607, 0089_SW305_230607, 0089_SW371_230607, 0089_PW364_230607, 0089_QC118_230607, 0089_SW130_230607, 0089_PW335_230607, 0089_SW134_230607, 0089_PW340_230607, 0089_PW341_230607, 0089_SW132_230607, 0089_PW363_230607, 0089_PW362_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	5	46	**10.87**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	46	**6.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	46	**6.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 53263 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 12/40 LS	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW128		07/06/2023 09:03 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_MW197		07/06/2023 10:54 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_MW200		07/06/2023 10:54 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_QC301		07/06/2023 11:21 AM	WATER	ALS: 2 Non ALS: 0	No	X			
005	0089_QC302		07/06/2023 11:21 AM	WATER	ALS: 2 Non ALS: 0	No	X			
006	0089_QC303		07/06/2023 11:22 AM	WATER	ALS: 2 Non ALS: 0	No	X			
007	0089_QC401		07/06/2023 11:22 AM	WATER	ALS: 0 Non ALS: 2	No	X			
008	0089_QC402		07/06/2023 11:23 AM	WATER	ALS: 0 Non ALS: 2	No	X			
009	0089_QC403		07/06/2023 11:23 AM	WATER	ALS: 0 Non ALS: 2	No	X			

Environmental Division Perth

Work Order Reference

EP2307555

Telephone : +61-8-9406 1301

CHAIN OF CUSTODY

COC#: 53263 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW128	HDPE (no PTFE)	20 mL	00350822082762	Grey	No	
001	0089_MW128	HDPE (no PTFE)	20 mL	00350822082836	Grey	No	
001	0089_MW128	Clear Plastic Bottle - Natural	125 mL	00070522067380	Green	No	
002	0089_MW197	HDPE (no PTFE)	20 mL	00350822083386	Grey	No	
002	0089_MW197	Clear Plastic Bottle - Natural	125 mL	00070522054754	Green	No	
002	0089_MW197	HDPE (no PTFE)	20 mL	00350822083463	Grey	No	
003	0089_MW200	Clear Plastic Bottle - Natural	125 mL	00070522054759	Green	No	
003	0089_MW200	HDPE (no PTFE)	20 mL	00350822082712	Grey	No	
003	0089_MW200	HDPE (no PTFE)	20 mL	00350822082700	Grey	No	
004	0089_QC301	HDPE (no PTFE)	20 mL	00350822082349	Grey	No	
004	0089_QC301	HDPE (no PTFE)	20 mL	00350822082393	Grey	No	
005	0089_QC302	HDPE (no PTFE)	20 mL	00350522039125	Grey	No	
005	0089_QC302	HDPE (no PTFE)	20 mL	00350522039212	Grey	No	
006	0089_QC303	HDPE (no PTFE)	20 mL	00350822082480	Grey	No	
006	0089_QC303	HDPE (no PTFE)	20 mL	00350822082585	Grey	No	

Total Bottle Count: ALS: 15, Non ALS: 6

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307555**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53263	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 12:40	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 19-Jun-2023	Scheduled Reporting Date	: **19-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307555-001	07-Jun-2023 09:03	0089_MW128_230607	✓	✓
EP2307555-002	07-Jun-2023 10:54	0089_MW197_230607	✓	✓
EP2307555-003	07-Jun-2023 10:54	0089_MW200_230607	✓	✓
EP2307555-004	07-Jun-2023 11:21	0089_QC301_230607	✓	
EP2307555-005	07-Jun-2023 11:21	0089_QC302_230607	✓	
EP2307555-006	07-Jun-2023 11:22	0089_QC303_230607	✓	
EP2307555-007	07-Jun-2023 11:22	0089_QC401_230607	✓	
EP2307555-008	07-Jun-2023 11:23	0089_QC402_230607	✓	
EP2307555-009	07-Jun-2023 11:23	0089_QC403_230607	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307555**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 12:40
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53263	Issue Date	: 19-Jun-2023 22:31
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW128_230607	0089_MW197_230607	0089_MW200_230607	----	----
				Sampling date / time	07-Jun-2023 09:03	07-Jun-2023 10:54	07-Jun-2023 10:54	----	----
Compound	CAS Number	LOR	Unit		EP2307555-001	EP2307555-002	EP2307555-003	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		271	537	524	----	----
Total Alkalinity as CaCO3	----	1	mg/L		271	537	524	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		28	258	258	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		120	2440	2560	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		96	116	114	----	----
Magnesium	7439-95-4	1	mg/L		28	124	126	----	----
Sodium	7440-23-5	1	mg/L		42	1850	1860	----	----
Potassium	7440-09-7	1	mg/L		1	69	70	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		9.38	84.9	88.0	----	----
ø Total Cations	----	0.01	meq/L		8.95	98.2	98.8	----	----
ø Ionic Balance	----	0.01	%		2.37	7.26	5.73	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.05	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.06	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		1.68	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW128_230607	0089_MW197_230607	0089_MW200_230607	----	----
				Sampling date / time	07-Jun-2023 09:03	07-Jun-2023 10:54	07-Jun-2023 10:54	----	----
Compound	CAS Number	LOR	Unit		EP2307555-001	EP2307555-002	EP2307555-003	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW128_230607	0089_MW197_230607	0089_MW200_230607	----	----
				Sampling date / time	07-Jun-2023 09:03	07-Jun-2023 10:54	07-Jun-2023 10:54	----	----
Compound	CAS Number	LOR	Unit		EP2307555-001	EP2307555-002	EP2307555-003	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**1.79**	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.74**	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.79**	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.3**	**119**	**108**	----	----
13C8-PFOA	----	0.02	%		**106**	**103**	**101**	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_230607	0089_QC302_230607	0089_QC303_230607	0089_QC401_230607	0089_QC402_230607
				Sampling date / time	07-Jun-2023 11:21	07-Jun-2023 11:21	07-Jun-2023 11:22	07-Jun-2023 11:22	07-Jun-2023 11:23
Compound	CAS Number	LOR	Unit		EP2307555-004	EP2307555-005	EP2307555-006	EP2307555-007	EP2307555-008
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_230607	0089_QC302_230607	0089_QC303_230607	0089_QC401_230607	0089_QC402_230607
				Sampling date / time	07-Jun-2023 11:21	07-Jun-2023 11:21	07-Jun-2023 11:22	07-Jun-2023 11:22	07-Jun-2023 11:23
Compound	CAS Number	LOR	Unit		EP2307555-004	EP2307555-005	EP2307555-006	EP2307555-007	EP2307555-008
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**107**	**112**	**112**	**108**
13C8-PFOA	----	0.02	%		**105**	**102**	**100**	**105**	**103**

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_230607	----	----	----	----
				Sampling date / time	07-Jun-2023 11:23	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2307555-009	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_230607	----	----	----	----
				Sampling date / time	07-Jun-2023 11:23	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2307555-009	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	----	----	----	----
13C8-PFOA	----	0.02	%		**101**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307555**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2023
C-O-C number	: 53263	Issue Date	: 19-Jun-2023
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5107533)									
EP2307500-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	559	560	0.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	559	560	0.2	0% - 20%
EP2307502-010	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	125	124	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5108420)									
EP2307670-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	254	262	3.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	254	262	3.0	0% - 20%
EP2307491-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	50	51	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	50	51	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5104231)									
EP2307491-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3	4	0.0	No Limit
EP2307500-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	31	29	5.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5104232)									
EP2307491-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	39	40	2.7	0% - 20%
EP2307500-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	71	69	2.2	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5105907)									
EP2307498-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	513	474	7.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1220	1210	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10500	10600	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	389	387	0.6	0% - 20%
EP2307502-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	445	432	3.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1320	1280	2.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	13200	13000	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	481	473	1.8	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107843)									
EP2307500-010	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2307502-015	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107843)									
EP2307500-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2307502-015	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107843) - continued									
EP2307502-015	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107843)									
EP2307500-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2307502-015	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107843)									
EP2307500-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107843) - continued									
EP2307502-015	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107843)									
EP2307500-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2307502-015	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5107533)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	103	87.8	118
				<1	200 mg/L	102	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 5108420)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	114	87.8	118
				<1	200 mg/L	103	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104231)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	89.9	112
				<1	500 mg/L	104	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5104232)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	107	88.6	113
				<1	1000 mg/L	99.2	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5105907)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	95.0	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.0	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107843)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	105	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	120	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	92.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	125	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	101	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	97.1	53.0	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107849)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	113	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	118	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	102	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	105	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	98.5	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107843)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	111	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	98.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	106	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	92.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	96.8	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107849)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	102	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	97.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	101	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	96.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107843)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	95.6	60.5	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107843) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	102	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107849)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	94.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	95.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	92.5	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	106	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	109	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	113	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	76.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107843)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	126	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	113	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	99.8	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107849)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	117	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	102	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	130	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	107	64.2	133
EP231P: PFAS Sums (QCLot: 5107843)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5107849)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5107849) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5104231)							
EP2307491-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	115	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5104232)							
EP2307491-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	99.5	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107843)							
EP2307502-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	110	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	114	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	89.3	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	112	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	105	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	95.4	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107843)							
EP2307502-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	112	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	109	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	98.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	113	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	104	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	108	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	116	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	110	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	94.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	99.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107843)							
EP2307502-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	119	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107843) - continued							
EP2307502-006	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	104	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	101	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	119	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	106	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107843)							
EP2307502-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	116	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	123	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	118	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	113	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307555**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling GW - MB	Issue Date	: 19-Jun-2023
Sampler	: [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	31	6.45	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	31	3.23	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) 0089_MW128_230607, 0089_MW197_230607	**07-Jun-2023**	**----**	----	----	**13-Jun-2023**	21-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P) 0089_MW200_230607	**07-Jun-2023**	**----**	----	----	**15-Jun-2023**	21-Jun-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) 0089_MW128_230607, 0089_MW197_230607, 0089_MW200_230607	**07-Jun-2023**	**----**	----	----	**19-Jun-2023**	05-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) 0089_MW128_230607, 0089_MW197_230607, 0089_MW200_230607	**07-Jun-2023**	**----**	----	----	**19-Jun-2023**	05-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F) 0089_MW128_230607, 0089_MW197_230607, 0089_MW200_230607	**07-Jun-2023**	**----**	----	----	**14-Jun-2023**	14-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW128_230607, 0089_MW197_230607, 0089_MW200_230607, 0089_QC301_230607, 0089_QC302_230607, 0089_QC303_230607, 0089_QC401_230607, 0089_QC402_230607, 0089_QC403_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW128_230607, 0089_MW197_230607, 0089_MW200_230607, 0089_QC301_230607, 0089_QC302_230607, 0089_QC303_230607, 0089_QC401_230607, 0089_QC402_230607, 0089_QC403_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW128_230607, 0089_MW197_230607, 0089_MW200_230607, 0089_QC301_230607, 0089_QC302_230607, 0089_QC303_230607, 0089_QC401_230607, 0089_QC402_230607, 0089_QC403_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW128_230607, 0089_MW197_230607, 0089_MW200_230607, 0089_QC301_230607, 0089_QC302_230607, 0089_QC303_230607, 0089_QC401_230607, 0089_QC402_230607, 0089_QC403_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW128_230607, 0089_MW197_230607, 0089_MW200_230607, 0089_QC301_230607, 0089_QC302_230607, 0089_QC303_230607, 0089_QC401_230607, 0089_QC402_230607, 0089_QC403_230607	**07-Jun-2023**	**15-Jun-2023**	04-Dec-2023	✓	**19-Jun-2023**	04-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	31	**6.45**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	31	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	31	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	31	**3.23**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2307586

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASCMP23 **Client:** Stantec **Project Manager:** [redacted]
Phone:

ALS Compass COC Reference: 53350 **# Samples:** **Sampler:**
Phone: ( )

53353, 53352, 58355, 53370, 53365, 53354, 53349, 53351

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8.6.23	Date / Time: 1800 8/6	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) COC#: 53349 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW217		08/06/2023 08:39 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_MW282		08/06/2023 08:51 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW224		08/06/2023 09:04 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW220		08/06/2023 09:16 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 53349 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW217	Clear Plastic Bottle - Natural	125 mL	00070522045814	Green	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00350822057712	Grey	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00350822081493	Grey	No	
002	0089_MW282	Clear Plastic Bottle - Natural	125 mL	00070522045747	Green	No	
002	0089_MW282	HDPE (no PTFE)	20 mL	00350822057843	Grey	No	
002	0089_MW282	HDPE (no PTFE)	20 mL	00350822081567	Grey	No	
003	0089_MW224	Clear Plastic Bottle - Natural	125 mL	00070522045654	Green	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00350822057781	Grey	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00350822057957	Grey	No	
004	0089_MW220	Clear Plastic Bottle - Natural	125 mL	00070522045834	Green	No	
004	0089_MW220	HDPE (no PTFE)	20 mL	00350822057810	Grey	No	
004	0089_MW220	HDPE (no PTFE)	20 mL	00350822057747	Grey	No	

Total Bottle Count: ALS: 12, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307586**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53349	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 18:00	Issue Date	: 12-Jun-2023
Client Requested Due Date	: 21-Jun-2023	Scheduled Reporting Date	: **21-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307586-001	08-Jun-2023 08:39	0089_MW217_230608	✓	✓
EP2307586-002	08-Jun-2023 08:51	0089_MW282_230608	✓	✓
EP2307586-003	08-Jun-2023 09:04	0089_MW224_230608	✓	✓
EP2307586-004	08-Jun-2023 09:16	0089_MW220_230608	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307586**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 18:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2023
C-O-C number	: 53349	Issue Date	: 21-Jun-2023 16:41
Sampler	: [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_230608	0089_MW282_230608	0089_MW224_230608	0089_MW220_230608	----
				Sampling date / time	08-Jun-2023 08:39	08-Jun-2023 08:51	08-Jun-2023 09:04	08-Jun-2023 09:16	----
Compound	CAS Number	LOR	Unit		EP2307586-001	EP2307586-002	EP2307586-003	EP2307586-004	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		306	474	316	263	----
Total Alkalinity as CaCO3	----	1	mg/L		306	474	316	263	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		35	12	37	22	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		31	53	106	79	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		102	178	62	102	----
Magnesium	7439-95-4	1	mg/L		11	19	19	16	----
Sodium	7440-23-5	1	mg/L		25	25	95	33	----
Potassium	7440-09-7	1	mg/L		7	<1	4	7	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		7.72	11.2	10.1	7.94	----
ø Total Cations	----	0.01	meq/L		7.26	11.5	8.89	8.02	----
ø Ionic Balance	----	0.01	%		3.04	1.40	6.23	0.50	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	1.25	<0.02	0.05	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	3.31	<0.02	0.05	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.02	37.5	<0.01	0.82	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	4.68	<0.02	0.10	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.02	81.5	<0.01	7.27	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		1.7	0.6	<0.1	0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		7.97	1.03	<0.02	0.17	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		5.63	6.27	<0.02	0.24	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_230608	0089_MW282_230608	0089_MW224_230608	0089_MW220_230608	----
				Sampling date / time	08-Jun-2023 08:39	08-Jun-2023 08:51	08-Jun-2023 09:04	08-Jun-2023 09:16	----
Compound	CAS Number	LOR	Unit		EP2307586-001	EP2307586-002	EP2307586-003	EP2307586-004	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.87**	**1.53**	<0.02	**0.10**	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.37**	**6.35**	<0.01	**0.14**	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.03**	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**19.2**	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**0.30**	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_230608	0089_MW282_230608	0089_MW224_230608	0089_MW220_230608	----
				Sampling date / time	08-Jun-2023 08:39	08-Jun-2023 08:51	08-Jun-2023 09:04	08-Jun-2023 09:16	----
Compound	CAS Number	LOR	Unit		EP2307586-001	EP2307586-002	EP2307586-003	EP2307586-004	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**36.1**	**144**	<0.01	**9.04**	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.04**	**119**	<0.01	**8.09**	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**36.1**	**136**	<0.01	**8.89**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**94.3**	**118**	**110**	----
13C8-PFOA	----	0.02	%		**108**	**99.9**	**102**	**101**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	***Low***	***High***
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307586**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2023
C-O-C number	: 53349	Issue Date	: 21-Jun-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
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General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5112672)									
EP2307586-002	0089_MW282_230608	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	474	472	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	474	472	0.4	0% - 20%
EP2307588-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	324	325	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	324	325	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5108859)									
EP2307586-001	0089_MW217_230608	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	35	34	0.0	0% - 20%
EP2307801-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	22700	22800	0.6	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5108860)									
EP2307586-001	0089_MW217_230608	ED045G: Chloride	16887-00-6	1	mg/L	31	32	0.0	0% - 20%
EP2307801-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	104000	102000	2.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5106377)									
EP2307586-001	0089_MW217_230608	ED093F: Calcium	7440-70-2	1	mg/L	102	105	2.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	11	11	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	25	25	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	7	8	0.0	No Limit
EP2307588-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	114	118	3.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	44	46	2.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	268	269	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.16	0.17	10.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	0.17	20.1	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.12	0.16	28.2	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.14	0.14	0.0	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	3.20	3.64	12.8	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.95	3.43	14.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.84	0.94	12.2	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.0	1.1	12.2	0% - 50%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.47	0.48	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5119859) - continued									
EP2307587-001	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	9.02	10.2	12.6	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.16	0.17	6.1	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	8.90	10.1	12.3	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5112672)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.1	87.8	118
				<1	200 mg/L	96.7	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5108859)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.3	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5108860)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	108	88.6	113
				<1	1000 mg/L	97.7	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5106377)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.5	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.7	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107858)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	112	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	113	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	102	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	107	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.3	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5119859)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	108	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	118	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	98.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	90.0	53.0	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107858)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	96.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	113	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	113	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	113	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	109	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	96.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	102	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	105	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	95.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107858)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	105	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	113	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5119859)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	107	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	117	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107858)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	113	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	118	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	88.8	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	106	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	111	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	119	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	110	64.2	133
EP231P: PFAS Sums (QCLot: 5107858)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5119859)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5108859)							
EP2307586-001	0089_MW217_230608	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	123	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5108860)							
EP2307586-001	0089_MW217_230608	ED045G: Chloride	16887-00-6	1000 mg/L	96.4	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	108	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	124	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	77.2	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	91.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	98.7	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	86.7	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	103	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	90.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	107	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	99.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	88.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	102	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	94.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	122	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	81.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	110	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	88.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859) - continued							
EP2307592-005	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	114	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	119	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307586**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling GW - CG	Issue Date	: 21-Jun-2023
Sampler	: [redacted]	No. of samples received	: 4
Order number	: pfas-omp/Stirling	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	30	3.33	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	30	3.33	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW217_230608, 0089_MW282_230608, 0089_MW224_230608, 0089_MW220_230608	**08-Jun-2023**	**----**	----	----	**15-Jun-2023**	22-Jun-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW217_230608, 0089_MW282_230608, 0089_MW224_230608, 0089_MW220_230608	**08-Jun-2023**	**----**	----	----	**20-Jun-2023**	06-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW217_230608, 0089_MW282_230608, 0089_MW224_230608, 0089_MW220_230608	**08-Jun-2023**	**----**	----	----	**20-Jun-2023**	06-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW217_230608, 0089_MW282_230608, 0089_MW224_230608, 0089_MW220_230608	**08-Jun-2023**	**----**	----	----	**15-Jun-2023**	15-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_230608, 0089_MW282_230608, 0089_MW224_230608, 0089_MW220_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_230608, 0089_MW282_230608, 0089_MW224_230608, 0089_MW220_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW217_230608, 0089_MW282_230608, 0089_MW224_230608, 0089_MW220_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_230608, 0089_MW282_230608, 0089_MW224_230608, 0089_MW220_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW217_230608, 0089_MW282_230608, 0089_MW224_230608, 0089_MW220_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	30	**3.33**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	30	**3.33**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2307587

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASMD23 Client: Stantec Project Manager: [redacted]
Phone:

ALS Compass COC Reference: 53350 # Samples: Sampler:
Phone: ( )

53353, 53352, 53356, 53370, 53365, 53354, 53349, 53351

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8.6.23	Date / Time: 1800 8/6	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 53350 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW228		08/06/2023 08:41 AM	WATER	ALS: 5 Non ALS: 0	No		X		extra PFAS bottles for lab QC
002	0089_MW227		08/06/2023 09:04 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_MW226		08/06/2023 09:54 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_QC301		08/06/2023 11:05 AM	WATER	ALS: 2 Non ALS: 0	No	X			
005	0089_QC302		08/06/2023 11:06 AM	WATER	ALS: 2 Non ALS: 0	No	X			
006	0089_QC303		08/06/2023 11:06 AM	WATER	ALS: 2 Non ALS: 0	No	X			
007	0089_QC401		08/06/2023 11:07 AM	WATER	ALS: 2 Non ALS: 0	No	X			
008	0089_QC402		08/06/2023 11:08 AM	WATER	ALS: 2 Non ALS: 0	No	X			
009	0089_QC403		08/06/2023 11:08 AM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

ALS COC#: 53350 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW228	HDPE (no PTFE)	20 mL	00350822082752	Grey	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00350822082558	Grey	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00350822082830	Grey	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00350822082462	Grey	No	
001	0089_MW228	Clear Plastic Bottle - Natural	125 mL	00070522067344	Green	No	
002	0089_MW227	Clear Plastic Bottle - Natural	125 mL	00070522067349	Green	No	
002	0089_MW227	HDPE (no PTFE)	20 mL	00350822082799	Grey	No	
002	0089_MW227	HDPE (no PTFE)	20 mL	00350822082858	Grey	No	
003	0089_MW226	HDPE (no PTFE)	20 mL	00350822082892	Grey	No	
003	0089_MW226	HDPE (no PTFE)	20 mL	00350822082803	Grey	No	
003	0089_MW226	Clear Plastic Bottle - Natural	125 mL	00070522054823	Green	No	
004	0089_QC301	HDPE (no PTFE)	20 mL	00350822082408	Grey	No	
004	0089_QC301	HDPE (no PTFE)	20 mL	00350822082458	Grey	No	
005	0089_QC302	HDPE (no PTFE)	20 mL	00350822082372	Grey	No	
005	0089_QC302	HDPE (no PTFE)	20 mL	00350822082600	Grey	No	
006	0089_QC303	HDPE (no PTFE)	20 mL	00350822082343	Grey	No	
006	0089_QC303	HDPE (no PTFE)	20 mL	00350822082548	Grey	No	
007	0089_QC401	HDPE (no PTFE)	20 mL	00350822082442	Grey	No	
007	0089_QC401	HDPE (no PTFE)	20 mL	00350822082527	Grey	No	
008	0089_QC402	HDPE (no PTFE)	20 mL	00350822082445	Grey	No	
008	0089_QC402	HDPE (no PTFE)	20 mL	00350822082556	Grey	No	
009	0089_QC403	HDPE (no PTFE)	20 mL	00350822082448	Grey	No	
009	0089_QC403	HDPE (no PTFE)	20 mL	00350822082506	Grey	No	

Total Bottle Count: ALS: 23, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307587**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53350	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 18:00	Issue Date	: 12-Jun-2023
Client Requested Due Date	: 21-Jun-2023	Scheduled Reporting Date	: **21-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307587-001	08-Jun-2023 08:41	0089_MW228_230608	✓	✓
EP2307587-002	08-Jun-2023 09:04	0089_MW227_230608	✓	✓
EP2307587-003	08-Jun-2023 09:54	0089_MW226_230608	✓	✓
EP2307587-004	08-Jun-2023 11:05	0089_QC301_230608	✓	
EP2307587-005	08-Jun-2023 11:06	0089_QC302_230608	✓	
EP2307587-006	08-Jun-2023 11:06	0089_QC303_230608	✓	
EP2307587-007	08-Jun-2023 11:07	0089_QC401_230608	✓	
EP2307587-008	08-Jun-2023 11:08	0089_QC402_230608	✓	
EP2307587-009	08-Jun-2023 11:08	0089_QC403_230608	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307587**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 18:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2023
C-O-C number	: 53350	Issue Date	: 21-Jun-2023 17:04
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_230608	0089_MW227_230608	0089_MW226_230608	----	----
				Sampling date / time	08-Jun-2023 08:41	08-Jun-2023 09:04	08-Jun-2023 09:54	----	----
Compound	CAS Number	LOR	Unit		EP2307587-001	EP2307587-002	EP2307587-003	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**581**	**360**	**601**	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**581**	**360**	**601**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**878**	**208**	**1920**	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**5500**	**852**	**13800**	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**232**	**114**	**480**	----	----
Magnesium	7439-95-4	1	mg/L		**491**	**79**	**1050**	----	----
Sodium	7440-23-5	1	mg/L		**3580**	**595**	**8410**	----	----
Potassium	7440-09-7	1	mg/L		**151**	**31**	**350**	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**185**	**35.6**	**441**	----	----
ø **Total Cations**	----	0.01	meq/L		**212**	**38.9**	**485**	----	----
ø **Ionic Balance**	----	0.01	%		**6.69**	**4.44**	**4.74**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.14**	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.12**	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.16**	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**1.0**	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**3.20**	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**2.95**	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_230608	0089_MW227_230608	0089_MW226_230608	----	----
				Sampling date / time	08-Jun-2023 08:41	08-Jun-2023 09:04	08-Jun-2023 09:54	----	----
Compound	CAS Number	LOR	Unit		EP2307587-001	EP2307587-002	EP2307587-003	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.84**	<0.02	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.14**	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.47**	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_230608	0089_MW227_230608	0089_MW226_230608	----	----
				Sampling date / time	08-Jun-2023 08:41	08-Jun-2023 09:04	08-Jun-2023 09:54	----	----
Compound	CAS Number	LOR	Unit		EP2307587-001	EP2307587-002	EP2307587-003	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	**----**	**----**
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**9.02**	<0.01	<0.01	**----**	**----**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.16**	<0.01	<0.01	**----**	**----**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**8.90**	<0.01	<0.01	**----**	**----**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**91.1**	**86.0**	**----**	**----**
13C8-PFOA	----	0.02	%		**100**	**102**	**98.7**	**----**	**----**

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_230608	0089_QC302_230608	0089_QC303_230608	0089_QC401_230608	0089_QC402_230608
				Sampling date / time	08-Jun-2023 11:05	08-Jun-2023 11:06	08-Jun-2023 11:06	08-Jun-2023 11:07	08-Jun-2023 11:08
Compound	CAS Number	LOR	Unit		EP2307587-004	EP2307587-005	EP2307587-006	EP2307587-007	EP2307587-008
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_230608	0089_QC302_230608	0089_QC303_230608	0089_QC401_230608	0089_QC402_230608
				Sampling date / time	08-Jun-2023 11:05	08-Jun-2023 11:06	08-Jun-2023 11:06	08-Jun-2023 11:07	08-Jun-2023 11:08
Compound	CAS Number	LOR	Unit		EP2307587-004	EP2307587-005	EP2307587-006	EP2307587-007	EP2307587-008
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**117**	**106**	**114**	**105**	**96.9**
13C8-PFOA	----	0.02	%		**104**	**98.8**	**118**	**99.6**	**103**

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_230608	----	----	----	----
				Sampling date / time	08-Jun-2023 11:08	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2307587-009	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_230608	----	----	----	----
				Sampling date / time	08-Jun-2023 11:08	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2307587-009	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	----	----	----	----
13C8-PFOA	----	0.02	%		**105**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307587**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2023
C-O-C number	: 53350	Issue Date	: 21-Jun-2023
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5112672)									
EP2307586-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	474	472	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	474	472	0.4	0% - 20%
EP2307588-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	324	325	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	324	325	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5106253)									
EP2307587-001	0089_MW228_230608	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	878	876	0.2	0% - 20%
EP2307590-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2460	2450	0.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5106254)									
EP2307587-001	0089_MW228_230608	ED045G: Chloride	16887-00-6	1	mg/L	5500	5530	0.6	0% - 20%
EP2307590-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18200	18300	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5106377)									
EP2307586-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	102	105	2.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	11	11	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	25	25	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	7	8	0.0	No Limit
EP2307588-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	114	118	3.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	44	46	2.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	268	269	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5119859)									
EP2307587-001	0089_MW228_230608	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.16	0.17	10.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	0.17	20.1	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.12	0.16	28.2	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5119859)									
EP2307587-001	0089_MW228_230608	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.14	0.14	0.0	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	3.20	3.64	12.8	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.95	3.43	14.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.84	0.94	12.2	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.0	1.1	12.2	0% - 50%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5119859)									
EP2307587-001	0089_MW228_230608	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5119859)									
EP2307587-001	0089_MW228_230608	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.47	0.48	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5119859) - continued									
EP2307587-001	0089_MW228_230608	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5119859)									
EP2307587-001	0089_MW228_230608	EP231X: Sum of PFAS	----	0.01	µg/L	9.02	10.2	12.6	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.16	0.17	6.1	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	8.90	10.1	12.3	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5112672)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.1	87.8	118
				<1	200 mg/L	96.7	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5106253)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.4	89.9	112
				<1	500 mg/L	99.1	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5106254)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	88.6	113
				<1	1000 mg/L	96.8	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5106377)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.5	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.7	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107858)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	112	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	113	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	102	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	107	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.3	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5119859)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	108	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	118	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	98.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	90.0	53.0	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107858)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	96.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	113	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	113	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	113	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	109	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	96.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	102	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	105	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	95.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107858)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	105	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	113	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5119859)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	107	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	117	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107858)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	113	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	118	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	88.8	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	106	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	111	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	119	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	110	64.2	133
EP231P: PFAS Sums (QCLot: 5107858)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5119859)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5106253)							
EP2307587-001	0089_MW228_230608	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	200 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5106254)							
EP2307587-001	0089_MW228_230608	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	108	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	124	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	77.2	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	91.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	98.7	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	86.7	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	103	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	90.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	107	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	99.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	88.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	102	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	94.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	122	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	81.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	110	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	88.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859) - continued							
EP2307592-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	114	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	119	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307587**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling GW - MB	Issue Date	: 21-Jun-2023
Sampler	: [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2307587--001	0089_MW228_230608	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2307587--001	0089_MW228_230608	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	30	3.33	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	30	3.33	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW228_230608, 0089_MW226_230608	0089_MW227_230608,	**08-Jun-2023**	**----**	----	**----**	**15-Jun-2023**	22-Jun-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW228_230608, 0089_MW226_230608	0089_MW227_230608,	**08-Jun-2023**	**----**	----	**----**	**19-Jun-2023**	06-Jul-2023	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW228_230608, 0089_MW226_230608	0089_MW227_230608,	**08-Jun-2023**	**----**	----	**----**	**19-Jun-2023**	06-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW228_230608, 0089_MW227_230608, 0089_MW226_230608	**08-Jun-2023**	**----**	----	----	**15-Jun-2023**	15-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW228_230608, 0089_MW227_230608, 0089_MW226_230608, 0089_QC301_230608, 0089_QC302_230608, 0089_QC303_230608, 0089_QC401_230608, 0089_QC402_230608, 0089_QC403_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW228_230608, 0089_MW227_230608, 0089_MW226_230608, 0089_QC301_230608, 0089_QC302_230608, 0089_QC303_230608, 0089_QC401_230608, 0089_QC402_230608, 0089_QC403_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW228_230608, 0089_MW227_230608, 0089_MW226_230608, 0089_QC301_230608, 0089_QC302_230608, 0089_QC303_230608, 0089_QC401_230608, 0089_QC402_230608, 0089_QC403_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW228_230608, 0089_MW227_230608, 0089_MW226_230608, 0089_QC301_230608, 0089_QC302_230608, 0089_QC303_230608, 0089_QC401_230608, 0089_QC402_230608, 0089_QC403_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW228_230608, 0089_MW227_230608, 0089_MW226_230608, 0089_QC301_230608, 0089_QC302_230608, 0089_QC303_230608, 0089_QC401_230608, 0089_QC402_230608, 0089_QC403_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	30	**3.33**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	30	**3.33**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2307588

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASCMP.23 **Client:** Stantec **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: 53350 **# Samples:** **Sampler:**

53353, 53352, 53356, 53370, 53365, 53354, 53349, 53351

Phone: ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8.6.23	Date / Time: 1800 8/6	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 53351 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW214		08/06/2023 08:44 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_MW216		08/06/2023 08:56 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW215		08/06/2023 09:06 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW225		08/06/2023 09:14 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 53351 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW214	HDPE (no PTFE)	20 mL	00350822082450	Grey	No	
001	0089_MW214	HDPE (no PTFE)	20 mL	00350822082595	Grey	No	
001	0089_MW214	Clear Plastic Bottle - Natural	125 mL	00070522054890	Green	No	
002	0089_MW216	HDPE (no PTFE)	20 mL	00350822082525	Grey	No	
002	0089_MW216	HDPE (no PTFE)	20 mL	00350822082528	Grey	No	
002	0089_MW216	Clear Plastic Bottle - Natural	125 mL	00070522067258	Green	No	
003	0089_MW215	HDPE (no PTFE)	20 mL	00350822082472	Grey	No	
003	0089_MW215	HDPE (no PTFE)	20 mL	00350822082444	Grey	No	
003	0089_MW215	Clear Plastic Bottle - Natural	125 mL	00070522054883	Green	No	
004	0089_MW225	HDPE (no PTFE)	20 mL	00350822082317	Grey	No	
004	0089_MW225	HDPE (no PTFE)	20 mL	00350822082410	Grey	No	
004	0089_MW225	Clear Plastic Bottle - Natural	125 mL	00070522054836	Green	No	

Total Bottle Count: ALS: 12, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307588**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53351	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - [redacted]		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 18:00	Issue Date	: 12-Jun-2023
Client Requested Due Date	: 21-Jun-2023	Scheduled Reporting Date	: **21-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307588-001	08-Jun-2023 08:44	0089_MW214_230608	✓	✓
EP2307588-002	08-Jun-2023 08:56	0089_MW216_230608	✓	✓
EP2307588-003	08-Jun-2023 09:06	0089_MW215_230608	✓	✓
EP2307588-004	08-Jun-2023 09:14	0089_MW225_230608	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307588**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 18:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2023
C-O-C number	: 53351	Issue Date	: 21-Jun-2023 22:24
Sampler	: [redacted]		
Site	: Stirling GW - [redacted]		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW214_230608	0089_MW216_230608	0089_MW215_230608	0089_MW225_230608	----
				Sampling date / time	08-Jun-2023 08:44	08-Jun-2023 08:56	08-Jun-2023 09:06	08-Jun-2023 09:14	----
Compound	CAS Number	LOR	Unit		EP2307588-001	EP2307588-002	EP2307588-003	EP2307588-004	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		453	288	279	324	----
Total Alkalinity as CaCO3	----	1	mg/L		453	288	279	324	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		19	240	149	43	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1250	825	611	482	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		223	196	161	141	----
Magnesium	7439-95-4	1	mg/L		82	59	42	41	----
Sodium	7440-23-5	1	mg/L		617	455	311	227	----
Potassium	7440-09-7	1	mg/L		6	9	13	5	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		44.7	34.0	25.9	21.0	----
ø Total Cations	----	0.01	meq/L		44.9	34.6	25.4	20.4	----
ø Ionic Balance	----	0.01	%		0.18	0.92	1.10	1.34	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.24	0.06	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.32	0.12	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	2.65	0.63	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.08	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.47	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	3.8	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	8.91	0.06	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	8.65	0.17	<0.02	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW214_230608	0089_MW216_230608	0089_MW215_230608	0089_MW225_230608	----
				Sampling date / time	08-Jun-2023 08:44	08-Jun-2023 08:56	08-Jun-2023 09:06	08-Jun-2023 09:14	----
Compound	CAS Number	LOR	Unit		EP2307588-001	EP2307588-002	EP2307588-003	EP2307588-004	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.50**	**0.04**	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.24**	**0.01**	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	**1.92**	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW214_230608	0089_MW216_230608	0089_MW215_230608	0089_MW225_230608	----
				Sampling date / time	08-Jun-2023 08:44	08-Jun-2023 08:56	08-Jun-2023 09:06	08-Jun-2023 09:14	----
Compound	CAS Number	LOR	Unit		EP2307588-001	EP2307588-002	EP2307588-003	EP2307588-004	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**27.8**	**1.09**	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**3.12**	**0.63**	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**27.4**	**0.97**	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**122**	**91.4**	**108**	----
13C8-PFOA	----	0.02	%		**103**	**107**	**99.9**	**95.7**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	***Low***	***High***
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307588**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2023
C-O-C number	: 53351	Issue Date	: 21-Jun-2023
Sampler	: [redacted]		
Site	: Stirling GW - [redacted]		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5112672)									
EP2307586-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	474	472	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	474	472	0.4	0% - 20%
EP2307588-004	0089_MW225_230608	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	324	325	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	324	325	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5108861)									
EP2307588-001	0089_MW214_230608	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	19	17	8.9	0% - 50%
EP2307592-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2740	2800	2.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5108862)									
EP2307588-001	0089_MW214_230608	ED045G: Chloride	16887-00-6	1	mg/L	1250	1260	0.4	0% - 20%
EP2307592-007	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19200	19400	0.7	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5106377)									
EP2307586-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	102	105	2.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	11	11	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	25	25	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	7	8	0.0	No Limit
EP2307588-004	0089_MW225_230608	ED093F: Calcium	7440-70-2	1	mg/L	141	141	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	41	42	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	227	224	1.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.16	0.17	10.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	0.17	20.1	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.12	0.16	28.2	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.14	0.14	0.0	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	3.20	3.64	12.8	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.95	3.43	14.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.84	0.94	12.2	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.0	1.1	12.2	0% - 50%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.47	0.48	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5119859) - continued									
EP2307587-001	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	9.02	10.2	12.6	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.16	0.17	6.1	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	8.90	10.1	12.3	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5112672)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.1	87.8	118
				<1	200 mg/L	96.7	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5108861)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5108862)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	94.7	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5106377)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.5	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.7	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107858)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	112	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	113	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	102	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	107	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.3	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5119859)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	108	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	118	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	98.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	90.0	53.0	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107858)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	96.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	113	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	113	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	113	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	109	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	96.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	102	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	105	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	95.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107858)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	105	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	113	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5119859)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	107	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	117	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107858)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	113	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	118	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	88.8	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	106	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	111	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	119	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	110	64.2	133
EP231P: PFAS Sums (QCLot: 5107858)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5119859)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5108861)							
EP2307588-001	0089_MW214_230608	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	98.6	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5108862)							
EP2307588-001	0089_MW214_230608	ED045G: Chloride	16887-00-6	1000 mg/L	86.6	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	108	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	124	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	77.2	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	91.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	98.7	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	86.7	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	103	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	90.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	107	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	99.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	88.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	102	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	94.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	122	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	81.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	110	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	88.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859) - continued							
EP2307592-005	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	114	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	119	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307588**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling GW - [redacted]	Issue Date	: 21-Jun-2023
Sampler	: [redacted]	No. of samples received	: 4
Order number	: pfas-omp/Stirling	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	30	3.33	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	30	3.33	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW214_230608, 0089_MW216_230608, 0089_MW215_230608, 0089_MW225_230608	**08-Jun-2023**	**----**	----	----	**15-Jun-2023**	22-Jun-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW214_230608, 0089_MW216_230608, 0089_MW215_230608, 0089_MW225_230608	**08-Jun-2023**	**----**	----	----	**21-Jun-2023**	06-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW214_230608, 0089_MW216_230608, 0089_MW215_230608, 0089_MW225_230608	**08-Jun-2023**	**----**	----	----	**21-Jun-2023**	06-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW214_230608, 0089_MW216_230608, 0089_MW215_230608, 0089_MW225_230608	**08-Jun-2023**	**----**	----	----	**15-Jun-2023**	15-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW214_230608, 0089_MW216_230608, 0089_MW215_230608, 0089_MW225_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW214_230608, 0089_MW216_230608, 0089_MW215_230608, 0089_MW225_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW214_230608, 0089_MW216_230608, 0089_MW215_230608, 0089_MW225_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW214_230608, 0089_MW216_230608, 0089_MW215_230608, 0089_MW225_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW214_230608, 0089_MW216_230608, 0089_MW215_230608, 0089_MW225_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	30	**3.33**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	30	**3.33**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

Work Order Reference
EP2307589

Telephone : 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASCMD_23 **Client:** Stantec **Project Manager** [redacted]

Phone: [redacted]

ALS Compass COC Reference: 53350 **# Samples:** **Sampler:**

Phone: ( )

53353, 53352, 53356, 53370, 53365, 53354, 53349, 53351

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8.6.23	Date / Time: 1800 8/6	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 53352 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted]

/ ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD308		08/06/2023 09:58 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD306		08/06/2023 09:58 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD307		08/06/2023 09:58 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD314		08/06/2023 09:59 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD315		08/06/2023 09:59 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD316		08/06/2023 09:59 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307589**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53352	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - [redacted]		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 18:00	Issue Date	: 12-Jun-2023
Client Requested Due Date	: 21-Jun-2023	Scheduled Reporting Date	: **21-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2307589-001	08-Jun-2023 09:58	0089_SD308_230608	✓	✓
EP2307589-002	08-Jun-2023 09:58	0089_SD306_230608	✓	✓
EP2307589-003	08-Jun-2023 09:58	0089_SD307_230608	✓	✓
EP2307589-004	08-Jun-2023 09:59	0089_SD314_230608	✓	✓
EP2307589-005	08-Jun-2023 09:59	0089_SD315_230608	✓	✓
EP2307589-006	08-Jun-2023 09:59	0089_SD316_230608	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307589**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 18:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Jun-2023
C-O-C number	: 53352	Issue Date	: 21-Jun-2023 16:20
Sampler	: [redacted]		
Site	: Stirling SD - [redacted]		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD308_230608	0089_SD306_230608	0089_SD307_230608	0089_SD314_230608	0089_SD315_230608
				Sampling date / time	08-Jun-2023 09:58	08-Jun-2023 09:58	08-Jun-2023 09:58	08-Jun-2023 09:59	08-Jun-2023 09:59
Compound	CAS Number	LOR	Unit		EP2307589-001	EP2307589-002	EP2307589-003	EP2307589-004	EP2307589-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**7.3**	**24.1**	**13.6**	**7.3**	**22.7**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD308_230608	0089_SD306_230608	0089_SD307_230608	0089_SD314_230608	0089_SD315_230608
				Sampling date / time	08-Jun-2023 09:58	08-Jun-2023 09:58	08-Jun-2023 09:58	08-Jun-2023 09:59	08-Jun-2023 09:59
Compound	CAS Number	LOR	Unit		EP2307589-001	EP2307589-002	EP2307589-003	EP2307589-004	EP2307589-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**108**	**98.5**	**101**	**97.5**	**112**
13C8-PFOA	----	0.0002	%		**101**	**98.0**	**101**	**100**	**92.5**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD316_230608	----	----	----	----
				Sampling date / time	08-Jun-2023 09:59	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2307589-006	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**24.7**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD316_230608	----	----	----	----
				Sampling date / time	08-Jun-2023 09:59	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2307589-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**97.5**	----	----	----	----
13C8-PFOA	----	0.0002	%		**96.5**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2307589**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Jun-2023
C-O-C number	: 53352	Issue Date	: 21-Jun-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - [redacted]		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5116444)									
EP2307589-001	0089_SD308_230608	EA055: Moisture Content	----	0.1	%	7.3	7.9	8.1	0% - 20%
EP2307594-001	Anonymous	EA055: Moisture Content	----	0.1	%	21.3	21.8	2.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5115434)									
EP2307589-001	0089_SD308_230608	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2307594-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5115434)									
EP2307589-001	0089_SD308_230608	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5115434) - continued									
EP2307589-001	0089_SD308_230608	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2307594-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5115434)									
EP2307589-001	0089_SD308_230608	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307594-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5115434)									
EP2307589-001	0089_SD308_230608	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307594-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5115434)									
EP2307589-001	0089_SD308_230608	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2307594-002	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5115434)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	110	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	95.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	108	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	104	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	104	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5115434)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	106	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	92.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5115434)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.9	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.9	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	117	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5115434)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5115434) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	109	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	119	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	108	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	108	54.8	124
EP231P: PFAS Sums (QCLot: 5115434)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5115434)							
EP2307589-002	0089_SD306_230608	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	114	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	102	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	90.7	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	103	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	110	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	97.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5115434)							
EP2307589-002	0089_SD306_230608	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	110	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	109	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	106	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	117	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	101	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	113	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	99.5	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	108	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	105	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	103	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5115434)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5115434) - continued							
EP2307589-002	0089_SD306_230608	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	106	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	97.8	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	111	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	92.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5115434)							
EP2307589-002	0089_SD306_230608	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	100	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	121	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	120	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	99.7	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307589**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling SD - [redacted]	Issue Date	: 21-Jun-2023
Sampler	: [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD308_230608, 0089_SD306_230608, 0089_SD307_230608, 0089_SD314_230608, 0089_SD315_230608, 0089_SD316_230608	**08-Jun-2023**	**----**	----	----	**16-Jun-2023**	22-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD308_230608, 0089_SD306_230608, 0089_SD314_230608, 0089_SD315_230608, 0089_SD316_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓
HDPE Soil Jar (EP231X)							
0089_SD307_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	26-Jul-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD308_230608, 0089_SD306_230608, 0089_SD314_230608, 0089_SD315_230608, 0089_SD316_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓
HDPE Soil Jar (EP231X)							
0089_SD307_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	26-Jul-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD308_230608, 0089_SD306_230608, 0089_SD314_230608, 0089_SD315_230608, 0089_SD316_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓
HDPE Soil Jar (EP231X)							
0089_SD307_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	26-Jul-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD308_230608, 0089_SD306_230608, 0089_SD314_230608, 0089_SD315_230608, 0089_SD316_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓
HDPE Soil Jar (EP231X)							
0089_SD307_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	26-Jul-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) 0089_SD308_230608, 0089_SD306_230608, 0089_SD314_230608, 0089_SD315_230608, 0089_SD316_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓
HDPE Soil Jar (EP231X) 0089_SD307_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	26-Jul-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
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ALS

Environmental Division
Perth
Work Order Reference
EP2307590

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASCMP23 **Client:** Stantec **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: 53350 **# Samples:** **Sampler:**

Phone: ( )

53353, 53352, 53355, 53370, 53365, 53358, 53349, 53351

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8.6.23	Date / Time: 1800 8/16	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 53353 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW310		08/06/2023 09:44 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_SW309		08/06/2023 09:44 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_SW311		08/06/2023 09:48 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW308		08/06/2023 09:49 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW316		08/06/2023 09:50 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_PW307		08/06/2023 09:50 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW315		08/06/2023 09:51 AM	WATER	ALS: 3 Non ALS: 0	No	X		
008	0089_PW314		08/06/2023 09:52 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_PW306		08/06/2023 09:52 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 53353 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW310	HDPE (no PTFE)	20 mL	00350822082312	Grey	No	
001	0089_SW310	HDPE (no PTFE)	20 mL	00350822082340	Grey	No	
001	0089_SW310	Clear Plastic Bottle - Natural	125 mL	00070522054848	Green	No	
002	0089_SW309	HDPE (no PTFE)	20 mL	00350822082474	Grey	No	
002	0089_SW309	HDPE (no PTFE)	20 mL	00350822082484	Grey	No	
002	0089_SW309	Clear Plastic Bottle - Natural	125 mL	00070522054844	Green	No	
003	0089_SW311	HDPE (no PTFE)	20 mL	00350822082461	Grey	No	
003	0089_SW311	HDPE (no PTFE)	20 mL	00350822082373	Grey	No	
003	0089_SW311	Clear Plastic Bottle - Natural	125 mL	00070522054797	Green	No	
004	0089_PW308	HDPE (no PTFE)	20 mL	00350822082487	Grey	No	
004	0089_PW308	HDPE (no PTFE)	20 mL	00350822082467	Grey	No	
004	0089_PW308	Clear Plastic Bottle - Natural	125 mL	00070522054714	Green	No	
005	0089_PW316	HDPE (no PTFE)	20 mL	00350822082532	Grey	No	
005	0089_PW316	HDPE (no PTFE)	20 mL	00350822082369	Grey	No	
005	0089_PW316	Clear Plastic Bottle - Natural	125 mL	00070522054792	Green	No	
006	0089_PW307	HDPE (no PTFE)	20 mL	00350822082583	Grey	No	
006	0089_PW307	HDPE (no PTFE)	20 mL	00350822082507	Grey	No	
006	0089_PW307	Clear Plastic Bottle - Natural	125 mL	00070522054721	Green	No	
007	0089_PW315	HDPE (no PTFE)	20 mL	00350822082544	Grey	No	
007	0089_PW315	HDPE (no PTFE)	20 mL	00350822082339	Grey	No	
007	0089_PW315	Clear Plastic Bottle - Natural	125 mL	00070522054858	Green	No	
008	0089_PW314	HDPE (no PTFE)	20 mL	00350822082353	Grey	No	
008	0089_PW314	HDPE (no PTFE)	20 mL	00350822082337	Grey	No	
008	0089_PW314	Clear Plastic Bottle - Natural	125 mL	00070522054900	Green	No	
009	0089_PW306	HDPE (no PTFE)	20 mL	00350822082324	Grey	No	
009	0089_PW306	HDPE (no PTFE)	20 mL	00350822082426	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 53353 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - Grapes

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_PW306	Clear Plastic Bottle - Natural	125 mL	00070522054785	Green	No	

Total Bottle Count: ALS: 27, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307590**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53353	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - [redacted]		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 18:00	Issue Date	: 12-Jun-2023
Client Requested Due Date	: 21-Jun-2023	Scheduled Reporting Date	: **21-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307590-001	08-Jun-2023 09:44	0089_SW310_230608	✓	✓
EP2307590-002	08-Jun-2023 09:44	0089_SW309_230608	✓	✓
EP2307590-003	08-Jun-2023 09:48	0089_SW311_230608	✓	✓
EP2307590-004	08-Jun-2023 09:49	0089_PW308_230608	✓	✓
EP2307590-005	08-Jun-2023 09:50	0089_PW316_230608	✓	✓
EP2307590-006	08-Jun-2023 09:50	0089_PW307_230608	✓	✓
EP2307590-007	08-Jun-2023 09:51	0089_PW315_230608	✓	✓
EP2307590-008	08-Jun-2023 09:52	0089_PW314_230608	✓	✓
EP2307590-009	08-Jun-2023 09:52	0089_PW306_230608	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307590**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 18:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2023
C-O-C number	: 53353	Issue Date	: 21-Jun-2023 16:58
Sampler	: [redacted]		
Site	: Stirling SW/PW - [redacted]		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SW310_230608	0089_SW309_230608	0089_SW311_230608	0089_PW308_230608	0089_PW316_230608
				Sampling date / time	08-Jun-2023 09:44	08-Jun-2023 09:44	08-Jun-2023 09:48	08-Jun-2023 09:49	08-Jun-2023 09:50
					EP2307590-001	EP2307590-002	EP2307590-003	EP2307590-004	EP2307590-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**118**	**118**	**119**	**135**	**131**
Total Alkalinity as CaCO3	----	1	mg/L		**118**	**118**	**119**	**135**	**131**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2480**	**2470**	**2300**	**2310**	**2790**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18800**	**18900**	**18700**	**18300**	**18500**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**495**	**475**	**449**	**478**	**472**
Magnesium	7439-95-4	1	mg/L		**1340**	**1280**	**1220**	**1240**	**1240**
Sodium	7440-23-5	1	mg/L		**11200**	**10800**	**10300**	**10600**	**10400**
Potassium	7440-09-7	1	mg/L		**401**	**398**	**377**	**383**	**384**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**584**	**587**	**578**	**567**	**582**
ø Total Cations	----	0.01	meq/L		**632**	**609**	**580**	**597**	**588**
ø Ionic Balance	----	0.01	%		**3.95**	**1.84**	**0.23**	**2.56**	**0.45**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW310_230608	0089_SW309_230608	0089_SW311_230608	0089_PW308_230608	0089_PW316_230608
				Sampling date / time	08-Jun-2023 09:44	08-Jun-2023 09:44	08-Jun-2023 09:48	08-Jun-2023 09:49	08-Jun-2023 09:50
Compound	CAS Number	LOR	Unit		EP2307590-001	EP2307590-002	EP2307590-003	EP2307590-004	EP2307590-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW310_230608	0089_SW309_230608	0089_SW311_230608	0089_PW308_230608	0089_PW316_230608
				Sampling date / time	08-Jun-2023 09:44	08-Jun-2023 09:44	08-Jun-2023 09:48	08-Jun-2023 09:49	08-Jun-2023 09:50
Compound	CAS Number	LOR	Unit		EP2307590-001	EP2307590-002	EP2307590-003	EP2307590-004	EP2307590-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**88.4**	**97.9**	**99.4**	**91.5**
13C8-PFOA	----	0.02	%		**99.2**	**103**	**98.9**	**104**	**100**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW307_230608	0089_PW315_230608	0089_PW314_230608	0089_PW306_230608	----
				Sampling date / time	08-Jun-2023 09:50	08-Jun-2023 09:51	08-Jun-2023 09:52	08-Jun-2023 09:52	----
Compound	CAS Number	LOR	Unit		EP2307590-006	EP2307590-007	EP2307590-008	EP2307590-009	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		134	147	133	135	----
Total Alkalinity as CaCO3	----	1	mg/L		134	147	133	135	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2220	2310	2460	2380	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18400	18400	18200	18200	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		471	527	491	487	----
Magnesium	7439-95-4	1	mg/L		1220	1320	1330	1250	----
Sodium	7440-23-5	1	mg/L		10400	11100	11200	10700	----
Potassium	7440-09-7	1	mg/L		383	405	406	385	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		568	570	567	566	----
ø Total Cations	----	0.01	meq/L		586	628	632	602	----
ø Ionic Balance	----	0.01	%		1.57	4.84	5.36	3.15	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW307_230608	0089_PW315_230608	0089_PW314_230608	0089_PW306_230608	----
				Sampling date / time	08-Jun-2023 09:50	08-Jun-2023 09:51	08-Jun-2023 09:52	08-Jun-2023 09:52	----
Compound	CAS Number	LOR	Unit		EP2307590-006	EP2307590-007	EP2307590-008	EP2307590-009	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW307_230608	0089_PW315_230608	0089_PW314_230608	0089_PW306_230608	----
				Sampling date / time	08-Jun-2023 09:50	08-Jun-2023 09:51	08-Jun-2023 09:52	08-Jun-2023 09:52	----
Compound	CAS Number	LOR	Unit		EP2307590-006	EP2307590-007	EP2307590-008	EP2307590-009	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**109**	**107**	**101**	**109**	----
13C8-PFOA	----	0.02	%		**105**	**99.3**	**102**	**115**	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307590**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2023
C-O-C number	: 53353	Issue Date	: 21-Jun-2023
Sampler	: [redacted]		
Site	: Stirling SW/PW - [redacted]		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5112672)									
EP2307586-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	474	472	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	474	472	0.4	0% - 20%
EP2307588-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	324	325	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	324	325	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5112907)									
EP2307590-005	0089_PW316_230608	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	131	131	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	131	131	0.0	0% - 20%
EP2307592-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	124	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5106253)									
EP2307587-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	878	876	0.2	0% - 20%
EP2307590-008	0089_PW314_230608	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2460	2450	0.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5106254)									
EP2307587-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	5500	5530	0.6	0% - 20%
EP2307590-008	0089_PW314_230608	ED045G: Chloride	16887-00-6	1	mg/L	18200	18300	0.4	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5106377)									
EP2307586-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	102	105	2.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	11	11	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	25	25	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	7	8	0.0	No Limit
EP2307588-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	114	118	3.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	44	46	2.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	268	269	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107859)									
EP2307592-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.16	0.17	10.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	0.17	20.1	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.12	0.16	28.2	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107859)									
EP2307592-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.04	0.03	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.14	0.14	0.0	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	3.20	3.64	12.8	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.95	3.43	14.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.84	0.94	12.2	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5119859) - continued									
EP2307587-001	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.0	1.1	12.2	0% - 50%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107859)									
EP2307592-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107859)									
EP2307592-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107859) - continued									
EP2307592-003	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.47	0.48	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107859)									
EP2307592-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.08	0.07	13.3	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.08	0.07	13.3	No Limit
EP231P: PFAS Sums (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	9.02	10.2	12.6	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.16	0.17	6.1	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	8.90	10.1	12.3	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5112672)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.1	87.8	118
				<1	200 mg/L	96.7	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 5112907)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	97.5	87.8	118
				<1	200 mg/L	97.6	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5106253)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.4	89.9	112
				<1	500 mg/L	99.1	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5106254)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	88.6	113
				<1	1000 mg/L	96.8	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5106377)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.5	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.7	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107858)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	112	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	113	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	102	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	107	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.3	53.0	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107859)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	112	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	114	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	99.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	96.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	101	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.1	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5119859)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	108	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	118	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	98.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	90.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107858)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	96.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	113	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	113	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	113	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107859)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	107	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	95.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	96.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.4	69.0	133

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107859) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	103	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	109	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	96.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	102	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	105	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	95.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107858)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	105	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	113	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107859)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	101	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	93.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	96.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	102	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	104	62.2	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107859) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	118	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5119859)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	107	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	117	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107858)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	113	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	118	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	88.8	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107859)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	101	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	122	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	118	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	110	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	106	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	111	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	119	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	110	64.2	133
EP231P: PFAS Sums (QCLot: 5107858)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5107859)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5119859)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5106253)							
EP2307587-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	200 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5106254)							
EP2307587-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	108	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	124	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	77.2	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	91.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	98.7	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	86.7	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	103	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	90.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	107	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859) - continued							
EP2307592-005	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	99.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	88.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	102	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	94.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	122	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	81.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	110	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	88.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	114	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	119	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307590**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling SW/PW - [redacted]	Issue Date	: 21-Jun-2023
Sampler	: [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2307587--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2307587--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC 2	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	40	5.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	40	2.50	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) 0089_SW310_230608, 0089_SW309_230608, 0089_SW311_230608, 0089_PW308_230608, 0089_PW316_230608, 0089_PW307_230608, 0089_PW315_230608, 0089_PW314_230608, 0089_PW306_230608	**08-Jun-2023**	**----**	----	**----**	**15-Jun-2023**	22-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW310_230608, 0089_SW309_230608, 0089_SW311_230608, 0089_PW308_230608, 0089_PW316_230608, 0089_PW307_230608, 0089_PW315_230608, 0089_PW314_230608, 0089_PW306_230608	**08-Jun-2023**	**----**	----	----	**19-Jun-2023**	06-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW310_230608, 0089_SW309_230608, 0089_SW311_230608, 0089_PW308_230608, 0089_PW316_230608, 0089_PW307_230608, 0089_PW315_230608, 0089_PW314_230608, 0089_PW306_230608	**08-Jun-2023**	**----**	----	----	**19-Jun-2023**	06-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW310_230608, 0089_SW309_230608, 0089_SW311_230608, 0089_PW308_230608, 0089_PW316_230608, 0089_PW307_230608, 0089_PW315_230608, 0089_PW314_230608, 0089_PW306_230608	**08-Jun-2023**	**----**	----	----	**15-Jun-2023**	15-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW310_230608, 0089_SW309_230608, 0089_SW311_230608, 0089_PW308_230608, 0089_PW316_230608, 0089_PW307_230608, 0089_PW315_230608, 0089_PW314_230608, 0089_PW306_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW310_230608, 0089_SW309_230608, 0089_SW311_230608, 0089_PW308_230608, 0089_PW316_230608, 0089_PW307_230608, 0089_PW315_230608, 0089_PW314_230608, 0089_PW306_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW310_230608, 0089_SW309_230608, 0089_SW311_230608, 0089_PW308_230608, 0089_PW316_230608, 0089_PW307_230608, 0089_PW315_230608, 0089_PW314_230608, 0089_PW306_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW310_230608, 0089_SW309_230608, 0089_SW311_230608, 0089_PW308_230608, 0089_PW316_230608, 0089_PW307_230608, 0089_PW315_230608, 0089_PW314_230608, 0089_PW306_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW310_230608, 0089_SW309_230608, 0089_SW311_230608, 0089_PW308_230608, 0089_PW316_230608, 0089_PW307_230608, 0089_PW315_230608, 0089_PW314_230608, 0089_PW306_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	40	**7.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	40	**7.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	40	**2.50**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2307591

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASMD23 **Client:** Stantec **Project Manager:** [redacted]
Phone: [redacted]

ALS Compass COC Reference: 53350 **# Samples:** **Sampler:**
Phone: ( )

53353, 53352, 53356, 53370, 53365, 53354, 53349, 53351

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8.6.23	Date / Time: 1800 8/6	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: **53354** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD405		08/06/2023 09:29 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD407		08/06/2023 09:31 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD409		08/06/2023 10:20 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307591**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53354	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 18:00	Issue Date	: 12-Jun-2023
Client Requested Due Date	: 21-Jun-2023	Scheduled Reporting Date	: **21-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2307591-001	08-Jun-2023 09:29	0089_SD405_230608	✓	✓
EP2307591-002	08-Jun-2023 09:31	0089_SD407_230608	✓	✓
EP2307591-003	08-Jun-2023 10:20	0089_SD409_230608	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307591**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 18:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Jun-2023
C-O-C number	: 53354	Issue Date	: 21-Jun-2023 16:21
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD405_230608	0089_SD407_230608	0089_SD409_230608	----	----
				Sampling date / time	08-Jun-2023 09:29	08-Jun-2023 09:31	08-Jun-2023 10:20	----	----
Compound	CAS Number	LOR	Unit		EP2307591-001	EP2307591-002	EP2307591-003	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		9.3	9.6	13.2	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD405_230608	0089_SD407_230608	0089_SD409_230608	----	----
				Sampling date / time	08-Jun-2023 09:29	08-Jun-2023 09:31	08-Jun-2023 10:20	----	----
Compound	CAS Number	LOR	Unit		EP2307591-001	EP2307591-002	EP2307591-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**93.0**	**97.5**	**110**	----	----
13C8-PFOA	----	0.0002	%		**98.5**	**99.5**	**86.0**	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2307591**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Jun-2023
C-O-C number	: 53354	Issue Date	: 21-Jun-2023
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5116444)									
EP2307589-001	Anonymous	EA055: Moisture Content	----	0.1	%	7.3	7.9	8.1	0% - 20%
EP2307594-001	Anonymous	EA055: Moisture Content	----	0.1	%	21.3	21.8	2.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5115434)									
EP2307589-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2307594-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5115434)									
EP2307589-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5115434) - continued									
EP2307589-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2307594-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5115434)									
EP2307589-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307594-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5115434)									
EP2307589-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307594-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5115434)									
EP2307589-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2307594-002	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5115434)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	110	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	95.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	108	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	104	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	104	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5115434)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	106	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	92.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5115434)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.9	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.9	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	117	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5115434)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5115434) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	109	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	119	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	108	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	108	54.8	124
EP231P: PFAS Sums (QCLot: 5115434)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5115434)							
EP2307589-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	114	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	102	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	90.7	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	103	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	110	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	97.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5115434)							
EP2307589-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	110	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	109	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	106	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	117	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	101	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	113	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	99.5	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	108	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	105	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	103	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5115434)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5115434) - continued							
EP2307589-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	106	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	97.8	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	111	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	92.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5115434)							
EP2307589-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	100	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	121	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	120	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	99.7	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307591**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling SD - MB	Issue Date	: 21-Jun-2023
Sampler	: [redacted]	No. of samples received	: 3
Order number	: pfas-omp/Stirling	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD405_230608, 0089_SD407_230608, 0089_SD409_230608	**08-Jun-2023**	**----**	----	----	**16-Jun-2023**	22-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD405_230608, 0089_SD407_230608, 0089_SD409_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD405_230608, 0089_SD407_230608, 0089_SD409_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD405_230608, 0089_SD407_230608, 0089_SD409_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD405_230608, 0089_SD407_230608, 0089_SD409_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD405_230608, 0089_SD407_230608, 0089_SD409_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2307592

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASCMD_23 **Client:** Stantec **Project Manager:** [redacted]

Phone: [redacted])

ALS Compass COC Reference: 53350 **# Samples:** **Sampler:**

53353, 53352, 53356, 53370, 53365, 53354, 53349, 53351 **Phone:** ( )

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8.6.23	Date / Time: 1800 8/6	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 53355 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW408		08/06/2023 09:25 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_SW406		08/06/2023 09:27 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW405		08/06/2023 09:28 AM	WATER	ALS: 5 Non ALS: 0	No	X		extra PFAS bottles for lab QC
004	0089_PW407		08/06/2023 09:32 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW409		08/06/2023 10:19 AM	WATER	ALS: 5 Non ALS: 0	No	X		
006	0089_SW410		08/06/2023 10:19 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_SW412		08/06/2023 10:47 AM	WATER	ALS: 3 Non ALS: 0	No	X		
008	0089_SW414		08/06/2023 10:49 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_SW416		08/06/2023 10:52 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 53355 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW408	HDPE (no PTFE)	20 mL	00350822082837	Grey	No	
001	0089_SW408	HDPE (no PTFE)	20 mL	00350822082647	Grey	No	
001	0089_SW408	Clear Plastic Bottle - Natural	125 mL	00070522054723	Green	No	
002	0089_SW406	HDPE (no PTFE)	20 mL	00350822082800	Grey	No	
002	0089_SW406	Clear Plastic Bottle - Natural	125 mL	00070522054766	Green	No	
002	0089_SW406	HDPE (no PTFE)	20 mL	00350822082744	Grey	No	
003	0089_PW405	Clear Plastic Bottle - Natural	125 mL	00070522054770	Green	No	
003	0089_PW405	HDPE (no PTFE)	20 mL	00350822082753	Grey	No	
003	0089_PW405	HDPE (no PTFE)	20 mL	00350822082771	Grey	No	
003	0089_PW405	HDPE (no PTFE)	20 mL	00350822082549	Grey	No	
003	0089_PW405	HDPE (no PTFE)	20 mL	00350822082388	Grey	No	
004	0089_PW407	HDPE (no PTFE)	20 mL	00350822082668	Grey	No	
004	0089_PW407	HDPE (no PTFE)	20 mL	00350822082705	Grey	No	
004	0089_PW407	Clear Plastic Bottle - Natural	125 mL	00070522067413	Green	No	
005	0089_PW409	Clear Plastic Bottle - Natural	125 mL	00070522067421	Green	No	
005	0089_PW409	HDPE (no PTFE)	20 mL	00350822083498	Grey	No	
005	0089_PW409	HDPE (no PTFE)	20 mL	00350822082389	Grey	No	
005	0089_PW409	HDPE (no PTFE)	20 mL	00350822082421	Grey	No	
005	0089_PW409	HDPE (no PTFE)	20 mL	00350822083253	Grey	No	
006	0089_SW410	Clear Plastic Bottle - Natural	125 mL	00070522054876	Green	No	
006	0089_SW410	HDPE (no PTFE)	20 mL	00350822082905	Grey	No	
006	0089_SW410	HDPE (no PTFE)	20 mL	00350822082639	Grey	No	
007	0089_SW412	Clear Plastic Bottle - Natural	125 mL	00070522067337	Green	No	
007	0089_SW412	HDPE (no PTFE)	20 mL	00350822082904	Grey	No	
007	0089_SW412	HDPE (no PTFE)	20 mL	00350822082665	Grey	No	
008	0089_SW414	HDPE (no PTFE)	20 mL	00350822082769	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 53355 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_SW414	Clear Plastic Bottle - Natural	125 mL	00070522054892	Green	No	
008	0089_SW414	HDPE (no PTFE)	20 mL	00350822082779	Grey	No	
009	0089_SW416	HDPE (no PTFE)	20 mL	00350822082719	Grey	No	
009	0089_SW416	HDPE (no PTFE)	20 mL	00350822082804	Grey	No	
009	0089_SW416	Clear Plastic Bottle - Natural	125 mL	00070522054764	Green	No	

Total Bottle Count: ALS: 31, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307592**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53355	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 18:00	Issue Date	: 12-Jun-2023
Client Requested Due Date	: 21-Jun-2023	Scheduled Reporting Date	: **21-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307592-001	08-Jun-2023 09:25	0089_SW408_230608	✓	✓
EP2307592-002	08-Jun-2023 09:27	0089_SW406_230608	✓	✓
EP2307592-003	08-Jun-2023 09:28	0089_PW405_230608	✓	✓
EP2307592-004	08-Jun-2023 09:32	0089_PW407_230608	✓	✓
EP2307592-005	08-Jun-2023 10:19	0089_PW409_230608	✓	✓
EP2307592-006	08-Jun-2023 10:19	0089_SW410_230608	✓	✓
EP2307592-007	08-Jun-2023 10:47	0089_SW412_230608	✓	✓
EP2307592-008	08-Jun-2023 10:49	0089_SW414_230608	✓	✓
EP2307592-009	08-Jun-2023 10:52	0089_SW416_230608	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307592**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 18:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2023
C-O-C number	: 53355	Issue Date	: 22-Jun-2023 17:22
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW408_230608	0089_SW406_230608	0089_PW405_230608	0089_PW407_230608	0089_PW409_230608
				Sampling date / time	08-Jun-2023 09:25	08-Jun-2023 09:27	08-Jun-2023 09:28	08-Jun-2023 09:32	08-Jun-2023 10:19
Compound	CAS Number	LOR	Unit		EP2307592-001	EP2307592-002	EP2307592-003	EP2307592-004	EP2307592-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**130**	**130**	**130**	**130**	**151**
Total Alkalinity as CaCO3	----	1	mg/L		**130**	**130**	**130**	**130**	**151**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2540**	**2490**	**2720**	**2750**	**2250**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17300**	**17400**	**18900**	**18800**	**15900**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**455**	**446**	**465**	**470**	**383**
Magnesium	7439-95-4	1	mg/L		**1210**	**1210**	**1230**	**1200**	**1020**
Sodium	7440-23-5	1	mg/L		**10900**	**10700**	**11000**	**10700**	**9010**
Potassium	7440-09-7	1	mg/L		**365**	**367**	**377**	**368**	**315**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**543**	**545**	**592**	**590**	**498**
ø Total Cations	----	0.01	meq/L		**606**	**597**	**612**	**597**	**503**
ø Ionic Balance	----	0.01	%		**5.42**	**4.50**	**1.67**	**0.58**	**0.46**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.04**	**0.04**	**0.04**	**0.04**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.04**	**0.04**	**0.04**	**0.04**	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW408_230608	0089_SW406_230608	0089_PW405_230608	0089_PW407_230608	0089_PW409_230608
				Sampling date / time	08-Jun-2023 09:25	08-Jun-2023 09:27	08-Jun-2023 09:28	08-Jun-2023 09:32	08-Jun-2023 10:19
Compound	CAS Number	LOR	Unit		EP2307592-001	EP2307592-002	EP2307592-003	EP2307592-004	EP2307592-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW408_230608	0089_SW406_230608	0089_PW405_230608	0089_PW407_230608	0089_PW409_230608
				Sampling date / time	08-Jun-2023 09:25	08-Jun-2023 09:27	08-Jun-2023 09:28	08-Jun-2023 09:32	08-Jun-2023 10:19
Compound	CAS Number	LOR	Unit		EP2307592-001	EP2307592-002	EP2307592-003	EP2307592-004	EP2307592-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.08**	**0.08**	**0.08**	**0.08**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.08**	**0.08**	**0.08**	**0.08**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**104**	**106**	**97.0**	**108**
13C8-PFOA	----	0.02	%		**108**	**103**	**105**	**101**	**97.8**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW410_230608	0089_SW412_230608	0089_SW414_230608	0089_SW416_230608	----
				Sampling date / time	08-Jun-2023 10:19	08-Jun-2023 10:47	08-Jun-2023 10:49	08-Jun-2023 10:52	----
Compound	CAS Number	LOR	Unit		EP2307592-006	EP2307592-007	EP2307592-008	EP2307592-009	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		124	119	122	120	----
Total Alkalinity as CaCO3	----	1	mg/L		124	119	122	120	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2510	2740	2690	2510	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17600	19200	19300	17500	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		461	472	462	455	----
Magnesium	7439-95-4	1	mg/L		1200	1220	1200	1200	----
Sodium	7440-23-5	1	mg/L		10700	10900	10600	10800	----
Potassium	7440-09-7	1	mg/L		366	374	369	371	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		551	601	603	548	----
ø Total Cations	----	0.01	meq/L		596	608	592	601	----
ø Ionic Balance	----	0.01	%		3.95	0.55	0.88	4.56	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW410_230608	0089_SW412_230608	0089_SW414_230608	0089_SW416_230608	----
				Sampling date / time	08-Jun-2023 10:19	08-Jun-2023 10:47	08-Jun-2023 10:49	08-Jun-2023 10:52	----
Compound	CAS Number	LOR	Unit		EP2307592-006	EP2307592-007	EP2307592-008	EP2307592-009	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW410_230608	0089_SW412_230608	0089_SW414_230608	0089_SW416_230608	----
				Sampling date / time	08-Jun-2023 10:19	08-Jun-2023 10:47	08-Jun-2023 10:49	08-Jun-2023 10:52	----
Compound	CAS Number	LOR	Unit		EP2307592-006	EP2307592-007	EP2307592-008	EP2307592-009	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**105**	**102**	**115**	----
13C8-PFOA	----	0.02	%		**102**	**101**	**102**	**104**	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307592**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2023
C-O-C number	: 53355	Issue Date	: 22-Jun-2023
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5112907)									
EP2307590-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	131	131	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	131	131	0.0	0% - 20%
EP2307592-006	0089_SW410_230608	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	124	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5108861)									
EP2307588-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	19	17	8.9	0% - 50%
EP2307592-007	0089_SW412_230608	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2740	2800	2.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5108862)									
EP2307588-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1250	1260	0.4	0% - 20%
EP2307592-007	0089_SW412_230608	ED045G: Chloride	16887-00-6	1	mg/L	19200	19400	0.7	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5106378)									
EP2307592-001	0089_SW408_230608	ED093F: Calcium	7440-70-2	1	mg/L	455	465	2.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1210	1220	0.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10900	10700	1.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	365	368	0.7	0% - 20%
EP2307593-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	473	485	2.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1220	1240	2.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10500	10700	1.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	369	375	1.8	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5107859)									
EP2307592-003	0089_PW405_230608	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.16	0.17	10.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	0.17	20.1	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.12	0.16	28.2	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5107859)									
EP2307592-003	0089_PW405_230608	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.04	0.03	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.14	0.14	0.0	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	3.20	3.64	12.8	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.95	3.43	14.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.84	0.94	12.2	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.0	1.1	12.2	0% - 50%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107859)									
EP2307592-003	0089_PW405_230608	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5107859) - continued									
EP2307592-003	0089_PW405_230608	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5107859)									
EP2307592-003	0089_PW405_230608	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.47	0.48	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5119859) - continued									
EP2307587-001	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5107859)									
EP2307592-003	0089_PW405_230608	EP231X: Sum of PFAS	----	0.01	µg/L	0.08	0.07	13.3	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.08	0.07	13.3	No Limit
EP231P: PFAS Sums (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	9.02	10.2	12.6	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.16	0.17	6.1	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	8.90	10.1	12.3	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5112907)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	97.5	87.8	118
				<1	200 mg/L	97.6	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5108861)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5108862)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	94.7	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5106378)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.4	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	95.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5107859)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	112	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	114	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	99.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	96.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	101	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.1	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5119859)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	108	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	118	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	98.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	90.0	53.0	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5107859)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	107	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	95.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	96.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	103	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	109	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	96.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	102	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	105	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	95.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5107859)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	101	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	93.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	96.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	102	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	104	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	118	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.8	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5119859)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	107	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	117	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5107859)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	101	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	122	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	118	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	110	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	106	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	111	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	119	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	110	64.2	133
EP231P: PFAS Sums (QCLot: 5107859)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5119859)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5108861)							
EP2307588-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	98.6	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5108862)							
EP2307588-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	86.6	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5119859)							
EP2307592-005	0089_PW409_230608	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	108	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	124	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	77.2	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	91.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	98.7	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	86.7	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859)							
EP2307592-005	0089_PW409_230608	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	103	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	90.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	107	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	99.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	88.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	102	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	94.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5119859)							
EP2307592-005	0089_PW409_230608	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	122	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	81.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	110	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	88.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859)							
EP2307592-005	0089_PW409_230608	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859) - continued							
EP2307592-005	0089_PW409_230608	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	114	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	119	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307592**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling SW/PW - MB	Issue Date	: 22-Jun-2023
Sampler	: [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	25	8.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	25	4.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW408_230608, 0089_SW406_230608, 0089_PW405_230608, 0089_PW407_230608, 0089_PW409_230608, 0089_SW410_230608, 0089_SW412_230608, 0089_SW414_230608, 0089_SW416_230608	**08-Jun-2023**	**----**	----	----	**15-Jun-2023**	22-Jun-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW408_230608, 0089_SW406_230608, 0089_PW405_230608, 0089_PW407_230608, 0089_PW409_230608, 0089_SW410_230608, 0089_SW412_230608, 0089_SW414_230608, 0089_SW416_230608	**08-Jun-2023**	**----**	----	----	**21-Jun-2023**	06-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW408_230608, 0089_SW406_230608, 0089_PW405_230608, 0089_PW407_230608, 0089_PW409_230608, 0089_SW410_230608, 0089_SW412_230608, 0089_SW414_230608, 0089_SW416_230608	**08-Jun-2023**	**----**	----	----	**21-Jun-2023**	06-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW408_230608, 0089_SW406_230608, 0089_PW405_230608, 0089_PW407_230608, 0089_PW409_230608, 0089_SW410_230608, 0089_SW412_230608, 0089_SW414_230608, 0089_SW416_230608	**08-Jun-2023**	**----**	----	----	**15-Jun-2023**	15-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW408_230608, 0089_SW406_230608, 0089_PW405_230608, 0089_PW407_230608, 0089_PW409_230608, 0089_SW410_230608, 0089_SW412_230608, 0089_SW414_230608, 0089_SW416_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW408_230608, 0089_SW406_230608, 0089_PW405_230608, 0089_PW407_230608, 0089_PW409_230608, 0089_SW410_230608, 0089_SW412_230608, 0089_SW414_230608, 0089_SW416_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW408_230608, 0089_SW406_230608, 0089_PW405_230608, 0089_PW407_230608, 0089_PW409_230608, 0089_SW410_230608, 0089_SW412_230608, 0089_SW414_230608, 0089_SW416_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW408_230608, 0089_SW406_230608, 0089_PW405_230608, 0089_PW407_230608, 0089_PW409_230608, 0089_SW410_230608, 0089_SW412_230608, 0089_SW414_230608, 0089_SW416_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW408_230608, 0089_SW406_230608, 0089_PW405_230608, 0089_PW407_230608, 0089_PW409_230608, 0089_SW410_230608, 0089_SW412_230608, 0089_SW414_230608, 0089_SW416_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	25	**8.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	25	**4.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2307593

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASMP23 **Client:** Stantec **Project Manager** [redacted]
Phone:

ALS Compass COC Reference: 53350 **# Samples:** **Sampler:**
Phone: ( )

53353, 53352, 53356, 53370, 53365, 53354, 53349, 53351

Turnaround Requirements: Standard

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8.6.23	Date / Time: 1800 8/6	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 53365 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW411		08/06/2023 10:41 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_PW413		08/06/2023 10:42 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW415		08/06/2023 10:43 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 53365 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW411	Clear Plastic Bottle - Natural	125 mL	00070522054712	Green	No	
001	0089_PW411	HDPE (no PTFE)	20 mL	00350822083325	Grey	No	
001	0089_PW411	HDPE (no PTFE)	20 mL	00350822083342	Grey	No	
002	0089_PW413	Clear Plastic Bottle - Natural	125 mL	00070522067330	Green	No	
002	0089_PW413	HDPE (no PTFE)	20 mL	00350822083328	Grey	No	
002	0089_PW413	HDPE (no PTFE)	20 mL	00350822083389	Grey	No	
003	0089_PW415	Clear Plastic Bottle - Natural	125 mL	00070522054799	Green	No	
003	0089_PW415	HDPE (no PTFE)	20 mL	00350822082873	Grey	No	
003	0089_PW415	HDPE (no PTFE)	20 mL	00350822082801	Grey	No	

Total Bottle Count: ALS: 9, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307593**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53365	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 18:00	Issue Date	: 12-Jun-2023
Client Requested Due Date	: 21-Jun-2023	Scheduled Reporting Date	: **21-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2307593-001	08-Jun-2023 10:41	0089_PW411_230608	✓	✓
EP2307593-002	08-Jun-2023 10:42	0089_PW413_230608	✓	✓
EP2307593-003	08-Jun-2023 10:43	0089_PW415_230608	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307593**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 18:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2023
C-O-C number	: 53365	Issue Date	: 21-Jun-2023 16:22
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW411_230608	0089_PW413_230608	0089_PW415_230608	----	----
				Sampling date / time	08-Jun-2023 10:41	08-Jun-2023 10:42	08-Jun-2023 10:43	----	----
Compound	CAS Number	LOR	Unit		EP2307593-001	EP2307593-002	EP2307593-003	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		236	150	120	----	----
Total Alkalinity as CaCO3	----	1	mg/L		236	150	120	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2690	2780	2670	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19200	18900	19300	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		418	473	420	----	----
Magnesium	7439-95-4	1	mg/L		1330	1220	1320	----	----
Sodium	7440-23-5	1	mg/L		13000	10500	12900	----	----
Potassium	7440-09-7	1	mg/L		457	369	453	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		602	594	602	----	----
ø Total Cations	----	0.01	meq/L		707	590	702	----	----
ø Ionic Balance	----	0.01	%		8.03	0.32	7.66	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW411_230608	0089_PW413_230608	0089_PW415_230608	----	----
				Sampling date / time	08-Jun-2023 10:41	08-Jun-2023 10:42	08-Jun-2023 10:43	----	----
Compound	CAS Number	LOR	Unit		EP2307593-001	EP2307593-002	EP2307593-003	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW411_230608	0089_PW413_230608	0089_PW415_230608	----	----
				Sampling date / time	08-Jun-2023 10:41	08-Jun-2023 10:42	08-Jun-2023 10:43	----	----
Compound	CAS Number	LOR	Unit		EP2307593-001	EP2307593-002	EP2307593-003	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**112**	**114**	----	----
13C8-PFOA	----	0.02	%		**104**	**105**	**106**	----	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2307593**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2023
C-O-C number	: 53365	Issue Date	: 21-Jun-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5112907)									
EP2307590-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	131	131	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	131	131	0.0	0% - 20%
EP2307592-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	124	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5106121)									
EP2307502-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2360	2340	0.6	0% - 20%
EP2307502-012	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2740	2780	1.3	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5106122)									
EP2307502-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17300	17300	0.3	0% - 20%
EP2307502-012	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19500	19300	0.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5106378)									
EP2307593-002	0089_PW413_230608	ED093F: Calcium	7440-70-2	1	mg/L	473	485	2.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1220	1240	2.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10500	10700	1.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	369	375	1.8	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.16	0.17	10.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	0.17	20.1	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5119859) - continued									
EP2307587-001	Anonymous	EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.12	0.16	28.2	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.14	0.14	0.0	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	3.20	3.64	12.8	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.95	3.43	14.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.84	0.94	12.2	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.0	1.1	12.2	0% - 50%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.47	0.48	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5119859)									
EP2307587-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	9.02	10.2	12.6	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5119859) - continued									
EP2307587-001	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.16	0.17	6.1	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	8.90	10.1	12.3	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5112907)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	97.5	87.8	118
				<1	200 mg/L	97.6	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5106121)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.5	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5106122)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	108	88.6	113
				<1	1000 mg/L	97.3	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5106378)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.4	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	95.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5119859)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	108	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	118	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	98.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	90.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	109	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	96.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	102	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.8	69.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	105	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	95.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5119859)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	107	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	117	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	106	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	111	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	119	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	110	64.2	133
EP231P: PFAS Sums (QCLot: 5119859)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5106121)							
EP2307502-001	Anonymous						

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5106121) - continued							
EP2307502-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5106122)							
EP2307502-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	108	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	124	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	77.2	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	91.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	98.7	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	86.7	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	103	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	90.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	107	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	99.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	88.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	102	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	94.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5119859)							
EP2307592-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	122	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	81.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	110	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	88.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5119859) - continued							
EP2307592-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	114	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	119	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307593**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling SW/PW - CG	Issue Date	: 21-Jun-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 3
Order number	: pfas-omp/Stirling	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2307502--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2307502--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Major Cations - Dissolved	1	12	8.33	10.00	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	15	6.67	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)		***Sample Date***	*Extraction / Preparation* ***Date extracted***	*Due for extraction*	*Evaluation*	*Analysis* ***Date analysed***	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW411_230608, 0089_PW415_230608	0089_PW413_230608,	**08-Jun-2023**	**----**	----	**----**	**15-Jun-2023**	22-Jun-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_PW411_230608, 0089_PW415_230608	0089_PW413_230608,	**08-Jun-2023**	**----**	----	**----**	**19-Jun-2023**	06-Jul-2023	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_PW411_230608, 0089_PW415_230608	0089_PW413_230608,	**08-Jun-2023**	**----**	----	**----**	**19-Jun-2023**	06-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW411_230608, 0089_PW413_230608, 0089_PW415_230608	**08-Jun-2023**	**----**	----	----	**15-Jun-2023**	15-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW411_230608, 0089_PW413_230608, 0089_PW415_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW411_230608, 0089_PW413_230608, 0089_PW415_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW411_230608, 0089_PW413_230608, 0089_PW415_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW411_230608, 0089_PW413_230608, 0089_PW415_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW411_230608, 0089_PW413_230608, 0089_PW415_230608	**08-Jun-2023**	**19-Jun-2023**	05-Dec-2023	✓	**21-Jun-2023**	05-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	12	**8.33**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2307594**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53370	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2023 18:00	Issue Date	: 12-Jun-2023
Client Requested Due Date	: 21-Jun-2023	Scheduled Reporting Date	: **21-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2307594-001	08-Jun-2023 10:44	0089_SD411_230608	✓	✓
EP2307594-002	08-Jun-2023 10:45	0089_SD413_230608	✓	✓
EP2307594-003	08-Jun-2023 10:45	0089_SD415_230608	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2307594**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023 18:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Jun-2023
C-O-C number	: 53370	Issue Date	: 21-Jun-2023 16:20
Sampler	: [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD411_230608	0089_SD413_230608	0089_SD415_230608	----	----
				Sampling date / time	08-Jun-2023 10:44	08-Jun-2023 10:45	08-Jun-2023 10:45	----	----
Compound	CAS Number	LOR	Unit		EP2307594-001	EP2307594-002	EP2307594-003	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**21.3**	**27.8**	**19.0**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD411_230608	0089_SD413_230608	0089_SD415_230608	----	----
				Sampling date / time	08-Jun-2023 10:44	08-Jun-2023 10:45	08-Jun-2023 10:45	----	----
Compound	CAS Number	LOR	Unit		EP2307594-001	EP2307594-002	EP2307594-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**108**	**106**	**112**	----	----
13C8-PFOA	----	0.0002	%		**97.5**	**106**	**102**	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2307594**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Jun-2023
C-O-C number	: 53370	Issue Date	: 21-Jun-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5116444)									
EP2307589-001	Anonymous	EA055: Moisture Content	----	0.1	%	7.3	7.9	8.1	0% - 20%
EP2307594-001	0089_SD411_230608	EA055: Moisture Content	----	0.1	%	21.3	21.8	2.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5115434)									
EP2307589-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2307594-002	0089_SD413_230608	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5115434)									
EP2307589-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5115434) - continued									
EP2307589-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2307594-002	0089_SD413_230608	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5115434)									
EP2307589-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307594-002	0089_SD413_230608	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5115434)									
EP2307589-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2307594-002	0089_SD413_230608	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5115434)									
EP2307589-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2307594-002	0089_SD413_230608	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5115434)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	110	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	95.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	108	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	104	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	104	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5115434)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	106	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	92.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5115434)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.9	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.9	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	117	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5115434)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5115434) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	109	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	119	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	108	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	108	54.8	124
EP231P: PFAS Sums (QCLot: 5115434)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5115434)							
EP2307589-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	114	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	102	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	90.7	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	103	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	110	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	97.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5115434)							
EP2307589-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	110	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	109	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	106	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	117	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	101	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	113	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	99.5	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	108	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	105	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	103	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5115434)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5115434) - continued							
EP2307589-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	106	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	97.8	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	111	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	92.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5115434)							
EP2307589-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	100	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	121	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	120	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	99.7	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2307594**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 08-Jun-2023
Site	: Stirling SD - CG	Issue Date	: 21-Jun-2023
Sampler	: [redacted]	No. of samples received	: 3
Order number	: pfas-omp/Stirling	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD411_230608, 0089_SD413_230608, 0089_SD415_230608	**08-Jun-2023**	**----**	----	----	**16-Jun-2023**	22-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD411_230608, 0089_SD413_230608, 0089_SD415_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD411_230608, 0089_SD413_230608, 0089_SD415_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD411_230608, 0089_SD413_230608, 0089_SD415_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD411_230608, 0089_SD413_230608, 0089_SD415_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD411_230608, 0089_SD413_230608, 0089_SD415_230608	**08-Jun-2023**	**16-Jun-2023**	05-Dec-2023	✓	**20-Jun-2023**	26-Jul-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Stantec Australia	Contact Name : [redacted]	Purchase Order : 304700525/730	COC Number : 304700525/730 -03
Office Address : GF, 226 Adelaide Terrace, Perth WA 6000		PROJECT Number : WA_0089_PFASOMP_23	Eurofins | mgt quote ID :
	Email for COC/SRN/Results : [redacted]	PROJECT Name : WA_0089_PFASOMP_23	Data output format: PDF; ESDAT

Special Directions & Comments :
Please send ESdat files to [redacted] with the project No in the header file

Please send invoice to
[redacted]

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	PFAS (28 analytes)
1	0089_QC201_230313	6/06/2023	Water	X
2	0089_QC202_230313	6/06/2023	Water	X
3	0089_QC203_230313	6/06/2023	Water	X
4	0089_QC204_230313	6/06/2023	Water	X
5	0089_QC205_230313	6/06/2023	Water	X
6	0089_QC206_230313	6/06/2023	Water	X
7	0089_QC207_230313	6/06/2023	Soil	X
8	0089_QC208_230313	6/06/2023	Water	X
9	0089_QC209_230313	6/06/2023	Water	X
10	0089_QC210_230313	7/06/2023	Water	X
11	0089_QC211_230313	7/06/2023	Water	X
12	0089_QC212_230313	7/06/2023	Water	X
13	0089_QC213_230313	7/06/2023	Soil	X
14	0089_QC214_230313	7/06/2023	Soil	X
15	0089_QC215_230313	7/06/2023	Water	X
16	0089_QC216_230314	7/06/2023	Water	X
17	0089_QC217_230314	7/06/2023	Water	X
18	0089_QC218_230314	7/06/2023	Water	X

Analytes

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	

Sample comments:

Laboratory Staff

Relinquished By:
Stantec Australia

Date & Time : 08/06/2023

Signature:

Received By [redacted]

Date & Time : 8/06/23 9:35

Signature: [redacted] @140°

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐

STANDARD ☑ Other:

Method Of Shipment

☑ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival:

Report number:
997465

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Sample Receipt Advice

Company name:	Stantec Australia Pty Ltd (WA)
Contact name:	[redacted]
Project name:	WA_0089_PFASOMP_23
Project ID:	WA_0089_PFASOMP_23
Turnaround time:	5 Day
Date/Time received	Jun 8, 2023 9:35 AM
Eurofins reference	997465

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

QC217 is a soil and not water as indicated in the COC. Sample dates have been updated on the sample ID from 230313 changed to 230606 and 230607. Please advise

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted] **on phone : or by email:** [redacted]

Results will be delivered electronically via email to [redacted] - [redacted]

Note: A copy of these results will also be delivered to the general Stantec Australia Pty Ltd (WA) email address.

Global Leader - Results you can trust

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 997465
Phone: [redacted]
Fax:

Received: Jun 8, 2023 9:35 AM
Due: Jun 15, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_230606	Jun 06, 2023		Water	L23-Jn0022027		X
2	0089_QC202_230606	Jun 06, 2023		Water	L23-Jn0022028		X
3	0089_QC203_230606	Jun 06, 2023		Water	L23-Jn0022029		X
4	0089_QC204_230606	Jun 06, 2023		Water	L23-Jn0022030		X
5	0089_QC205_230606	Jun 06, 2023		Water	L23-Jn0022031		X
6	0089_QC206_230606	Jun 06, 2023		Water	L23-Jn0022032		X
7	0089_QC207_230606	Jun 06, 2023		Soil	L23-Jn0022033	X	X
8	0089_QC208_230606	Jun 06, 2023		Water	L23-Jn0022034		X

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
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WA 6000

Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 997465
Phone: [redacted]
Fax:

Received: Jun 8, 2023 9:35 AM
Due: Jun 15, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0089_QC209_230606	Jun 06, 2023		Water	L23-Jn0022035		X
10	0089_QC210_230607	Jun 07, 2023		Water	L23-Jn0022036		X
11	0089_QC211_230607	Jun 07, 2023		Water	L23-Jn0022037		X
12	0089_QC212_230607	Jun 07, 2023		Water	L23-Jn0022038		X
13	0089_QC213_230607	Jun 07, 2023		Soil	L23-Jn0022039	X	X
14	0089_QC214_230607	Jun 07, 2023		Soil	L23-Jn0022040	X	X
15	0089_QC215_230607	Jun 07, 2023		Water	L23-Jn0022041		X
16	0089_QC216_230607	Jun 07, 2023		Water	L23-Jn0022042		X
17	0089_QC217_230607	Jun 07, 2023		Soil	L23-Jn0022043	X	X
18	0089_QC218_	Jun 07, 2023		Water	L23-Jn0022044		X

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Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 997465
Phone: [redacted]
Fax:

Received: Jun 8, 2023 9:35 AM
Due: Jun 15, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
18	0089_QC218_230607	Jun 07, 2023		Water	L23-Jn0022044		
Test Counts						4	18

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NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **997465-S**
Project name WA_0089_PFASOMP_23
Project ID WA_0089_PFASOMP_23
Received Date Jun 08, 2023

Client Sample ID			0089_QC207_230606	0089_QC213_230607	0089_QC214_230607	0089_QC217_230607
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L23-Jn0022033**	**L23-Jn0022039**	**L23-Jn0022040**	**L23-Jn0022043**
Date Sampled			**Jun 06, 2023**	**Jun 07, 2023**	**Jun 07, 2023**	**Jun 07, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	15	31	13	30
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	62	55	64	55
13C5-PFPeA (surr.)	1	%	91	81	91	81
13C5-PFHxA (surr.)	1	%	97	89	97	87
13C4-PFHpA (surr.)	1	%	102	95	107	95
13C8-PFOA (surr.)	1	%	106	97	106	97
13C5-PFNA (surr.)	1	%	111	100	112	96
13C6-PFDA (surr.)	1	%	118	108	120	111
13C2-PFUnDA (surr.)	1	%	116	108	118	111
13C2-PFDoDA (surr.)	1	%	126	129	130	126
13C2-PFTeDA (surr.)	1	%	105	116	116	118
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			0089_QC207_230606	0089_QC213_230607	0089_QC214_230607	0089_QC217_230607
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L23-Jn0022033	L23-Jn0022039	L23-Jn0022040	L23-Jn0022043
Date Sampled			Jun 06, 2023	Jun 07, 2023	Jun 07, 2023	Jun 07, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	92	87	93	86
D3-N-MeFOSA (surr.)	1	%	108	101	108	100
D5-N-EtFOSA (surr.)	1	%	110	109	114	107
D7-N-MeFOSE (surr.)	1	%	127	120	123	117
D9-N-EtFOSE (surr.)	1	%	122	120	124	118
D5-N-EtFOSAA (surr.)	1	%	89	68	83	72
D3-N-MeFOSAA (surr.)	1	%	87	70	85	73
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	110	101	114	103
18O2-PFHxS (surr.)	1	%	107	98	109	100
13C8-PFOS (surr.)	1	%	103	98	108	98
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	80	66	79	67
13C2-6:2 FTSA (surr.)	1	%	92	71	91	84
13C2-8:2 FTSA (surr.)	1	%	86	67	87	72
13C2-10:2 FTSA (surr.)	1	%	118	107	121	113
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Jun 09, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Jun 14, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Jun 14, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Jun 14, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Jun 14, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Jun 09, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 997465
Phone: [redacted]
Fax:

Received: Jun 8, 2023 9:35 AM
Due: Jun 15, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_230606	Jun 06, 2023		Water	L23-Jn0022027		X
2	0089_QC202_230606	Jun 06, 2023		Water	L23-Jn0022028		X
3	0089_QC203_230606	Jun 06, 2023		Water	L23-Jn0022029		X
4	0089_QC204_230606	Jun 06, 2023		Water	L23-Jn0022030		X
5	0089_QC205_230606	Jun 06, 2023		Water	L23-Jn0022031		X
6	0089_QC206_230606	Jun 06, 2023		Water	L23-Jn0022032		X
7	0089_QC207_230606	Jun 06, 2023		Soil	L23-Jn0022033	X	X
8	0089_QC208_230606	Jun 06, 2023		Water	L23-Jn0022034		X

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Received: Jun 8, 2023 9:35 AM
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Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0089_QC209_230606	Jun 06, 2023		Water	L23-Jn0022035		X
10	0089_QC210_230607	Jun 07, 2023		Water	L23-Jn0022036		X
11	0089_QC211_230607	Jun 07, 2023		Water	L23-Jn0022037		X
12	0089_QC212_230607	Jun 07, 2023		Water	L23-Jn0022038		X
13	0089_QC213_230607	Jun 07, 2023		Soil	L23-Jn0022039	X	X
14	0089_QC214_230607	Jun 07, 2023		Soil	L23-Jn0022040	X	X
15	0089_QC215_230607	Jun 07, 2023		Water	L23-Jn0022041		X
16	0089_QC216_230607	Jun 07, 2023		Water	L23-Jn0022042		X
17	0089_QC217_230607	Jun 07, 2023		Soil	L23-Jn0022043	X	X
18	0089_QC218_	Jun 07, 2023		Water	L23-Jn0022044		X

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Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
18	0089_QC218_230607	Jun 07, 2023		Water	L23-Jn0022044		
Test Counts						4	18

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	112			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	95			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	103			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	101			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	104			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	109			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	114			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	117			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	100			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	129			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	100			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	102			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	109			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	105			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	107			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	109			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	109			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	107			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	96			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	125			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	96			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	90			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	101			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	112			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	107			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	122			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	106			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	106			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	100			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L23-Jn0022039	CP	%	118			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L23-Jn0022039	CP	%	118			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L23-Jn0022039	CP	%	106			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L23-Jn0022039	CP	%	106			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L23-Jn0022039	CP	%	108			50-150	Pass	
Perfluorononanoic acid (PFNA)	L23-Jn0022039	CP	%	112			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L23-Jn0022039	CP	%	106			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L23-Jn0022039	CP	%	121			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L23-Jn0022039	CP	%	108			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L23-Jn0022039	CP	%	130			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L23-Jn0022039	CP	%	105			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L23-Jn0022039	CP	%	108			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L23-Jn0022039	CP	%	110			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L23-Jn0022039	CP	%	104			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L23-Jn0022039	CP	%	110			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L23-Jn0022039	CP	%	117			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L23-Jn0022039	CP	%	115			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L23-Jn0022039	CP	%	116			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L23-Jn0022039	CP	%	100			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L23-Jn0022039	CP	%	134			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L23-Jn0022039	CP	%	93			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L23-Jn0022039	CP	%	102			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L23-Jn0022039	CP	%	100			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L23-Jn0022039	CP	%	123			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	L23-Jn0022039	CP	%	106			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L23-Jn0022039	CP	%	133			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L23-Jn0022039	CP	%	110			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L23-Jn0022039	CP	%	110			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L23-Jn0022039	CP	%	115			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L23-Jn0022039	CP	%	101			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	L23-Jn0021957	NCP	%	18	18	1.5	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	K23-Jn0014982	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	K23-Jn0014982	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	K23-Jn0014982	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	K23-Jn0014982	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS
[redacted] Senior Analyst-Sample Properties

[redacted]
[redacted]
General Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Stantec Australia Pty Limited
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WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
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Attention: [redacted]

Report **997465-W**
Project name WA_0089_PFASOMP_23
Project ID WA_0089_PFASOMP_23
Received Date Jun 08, 2023

Client Sample ID			**0089_QC201_230606**	**0089_QC202_230606**	**0089_QC203_230606**	**0089_QC204_230606**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L23-Jn0022027**	**L23-Jn0022028**	**L23-Jn0022029**	**L23-Jn0022030**
Date Sampled			**Jun 06, 2023**	**Jun 06, 2023**	**Jun 06, 2023**	**Jun 06, 2023**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	0.17
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.04	0.13	0.03	0.46
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	[N09]0.25	[N09]0.08	[N09]0.13	[N09]2.5
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]0.03	[N09]0.01	[N09]0.01	[N09]0.59
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]0.01	[N09]< 0.01	[N09]0.22	[N09]4.9
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.05
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	93	69	58	80
13C5-PFPeA (surr.)	1	%	85	88	84	75
13C5-PFHxA (surr.)	1	%	93	112	100	85
13C4-PFHpA (surr.)	1	%	90	94	79	72
13C8-PFOA (surr.)	1	%	74	85	60	69
13C5-PFNA (surr.)	1	%	81	88	64	48
13C6-PFDA (surr.)	1	%	101	119	76	41
13C2-PFUnDA (surr.)	1	%	88	114	88	113
13C2-PFDoDA (surr.)	1	%	85	123	93	123
13C2-PFTeDA (surr.)	1	%	66	108	74	98
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	0.06
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	132	141	104	133
D3-N-MeFOSA (surr.)	1	%	110	81	25	55

Client Sample ID			0089_QC201_230606	0089_QC202_230606	0089_QC203_230606	0089_QC204_230606
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L23-Jn0022027**	**L23-Jn0022028**	**L23-Jn0022029**	**L23-Jn0022030**
Date Sampled			**Jun 06, 2023**	**Jun 06, 2023**	**Jun 06, 2023**	**Jun 06, 2023**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	121	95	41	64
D7-N-MeFOSE (surr.)	1	%	44	52	26	50
D9-N-EtFOSE (surr.)	1	%	41	44	26	44
D5-N-EtFOSAA (surr.)	1	%	86	104	83	109
D3-N-MeFOSAA (surr.)	1	%	106	122	98	125
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.24	< 0.01	0.02	0.14
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.02
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	0.07	< 0.01	< 0.01	0.06
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	0.26	0.01	0.06	[N09]0.82
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]1.9	[N09]0.11	[N09]2.2	[N09]32
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	0.25	[N09]6.7
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.01	[N09]0.06	[N09]2.2	[N09]33
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	95	104	101	78
18O2-PFHxS (surr.)	1	%	85	97	90	111
13C8-PFOS (surr.)	1	%	90	99	94	100
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	0.30
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	97	116	104	116
13C2-6:2 FTSA (surr.)	1	%	101	105	88	81
13C2-8:2 FTSA (surr.)	1	%	84	101	79	73
13C2-10:2 FTSA (surr.)	1	%	78	109	85	116
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	1.91	0.17	4.4	65
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.02	0.06	2.42	37.9
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	1.92	0.17	4.62	69.9
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	2.48	0.39	4.81	74.06
Sum of PFASs (n=30)*	0.1	ug/L	2.81	0.4	5.12	81.77

Client Sample ID			0089_QC205_230606	0089_QC206_230606	0089_QC208_230606	0089_QC209_230606
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L23-Jn0022031**	**L23-Jn0022032**	**L23-Jn0022034**	**L23-Jn0022035**
Date Sampled			**Jun 06, 2023**	**Jun 06, 2023**	**Jun 06, 2023**	**Jun 06, 2023**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			0089_QC205_230606	0089_QC206_230606	0089_QC208_230606	0089_QC209_230606
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Jn0022031	L23-Jn0022032	L23-Jn0022034	L23-Jn0022035
Date Sampled			Jun 06, 2023	Jun 06, 2023	Jun 06, 2023	Jun 06, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	52	81	55	83
13C5-PFPeA (surr.)	1	%	106	107	106	83
13C5-PFHxA (surr.)	1	%	117	120	122	102
13C4-PFHpA (surr.)	1	%	105	105	101	89
13C8-PFOA (surr.)	1	%	99	97	93	80
13C5-PFNA (surr.)	1	%	87	83	83	72
13C6-PFDA (surr.)	1	%	128	77	90	77
13C2-PFUnDA (surr.)	1	%	122	69	84	63
13C2-PFDoDA (surr.)	1	%	126	67	91	63
13C2-PFTeDA (surr.)	1	%	94	66	111	53
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	121	91	94	92
D3-N-MeFOSA (surr.)	1	%	29	46	103	65
D5-N-EtFOSA (surr.)	1	%	42	54	137	72
D7-N-MeFOSE (surr.)	1	%	26	54	70	72
D9-N-EtFOSE (surr.)	1	%	26	56	81	70
D5-N-EtFOSAA (surr.)	1	%	110	74	87	72
D3-N-MeFOSAA (surr.)	1	%	126	75	85	73
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]0.05	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	108	108	107	103
18O2-PFHxS (surr.)	1	%	112	89	91	87
13C8-PFOS (surr.)	1	%	100	74	79	70

Client Sample ID			0089_QC205_230606	0089_QC206_230606	0089_QC208_230606	0089_QC209_230606
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Jn0022031	L23-Jn0022032	L23-Jn0022034	L23-Jn0022035
Date Sampled			Jun 06, 2023	Jun 06, 2023	Jun 06, 2023	Jun 06, 2023
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	121	142	138	83
13C2-6:2 FTSA (surr.)	1	%	111	116	110	91
13C2-8:2 FTSA (surr.)	1	%	94	89	91	81
13C2-10:2 FTSA (surr.)	1	%	113	83	101	76
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	0.05	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	0.05	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	0.05	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			0089_QC210_230607	0089_QC211_230607	0089_QC212_230607	0089_QC215_230607
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Jn0022036	L23-Jn0022037	L23-Jn0022038	L23-Jn0022041
Date Sampled			Jun 07, 2023	Jun 07, 2023	Jun 07, 2023	Jun 07, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	69	79	54	52
13C5-PFPeA (surr.)	1	%	107	100	110	100
13C5-PFHxA (surr.)	1	%	120	112	124	116
13C4-PFHpA (surr.)	1	%	108	98	108	104
13C8-PFOA (surr.)	1	%	98	88	102	98
13C5-PFNA (surr.)	1	%	89	78	92	89
13C6-PFDA (surr.)	1	%	101	84	104	103
13C2-PFUnDA (surr.)	1	%	87	72	97	89
13C2-PFDoDA (surr.)	1	%	89	76	102	97
13C2-PFTeDA (surr.)	1	%	87	91	112	102

Client Sample ID			0089_QC210_230607	0089_QC211_230607	0089_QC212_230607	0089_QC215_230607
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Jn0022036	L23-Jn0022037	L23-Jn0022038	L23-Jn0022041
Date Sampled			Jun 07, 2023	Jun 07, 2023	Jun 07, 2023	Jun 07, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	97	96	105	111
D3-N-MeFOSA (surr.)	1	%	52	87	72	140
D5-N-EtFOSA (surr.)	1	%	64	114	84	150
D7-N-MeFOSE (surr.)	1	%	72	78	95	132
D9-N-EtFOSE (surr.)	1	%	73	86	95	131
D5-N-EtFOSAA (surr.)	1	%	91	78	97	97
D3-N-MeFOSAA (surr.)	1	%	94	78	104	93
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	[N09]0.02	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	112	111	110	105
18O2-PFHxS (surr.)	1	%	96	88	97	96
13C8-PFOS (surr.)	1	%	82	77	87	89
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	0.11	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	118	109	138	126
13C2-6:2 FTSA (surr.)	1	%	113	94	119	112
13C2-8:2 FTSA (surr.)	1	%	100	81	107	100
13C2-10:2 FTSA (surr.)	1	%	112	92	128	117
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	0.02	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	0.02	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	0.02	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	0.13	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	0.13	< 0.1	< 0.1

Client Sample ID			0089_QC216_230607	0089_QC218_230607
Sample Matrix			Water	Water
Eurofins Sample No.			L23-Jn0022042	L23-Jn0022044
Date Sampled			Jun 07, 2023	Jun 07, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	62	50
13C5-PFPeA (surr.)	1	%	91	92
13C5-PFHxA (surr.)	1	%	106	107
13C4-PFHpA (surr.)	1	%	88	91
13C8-PFOA (surr.)	1	%	75	83
13C5-PFNA (surr.)	1	%	65	72
13C6-PFDA (surr.)	1	%	74	77
13C2-PFUnDA (surr.)	1	%	59	56
13C2-PFDoDA (surr.)	1	%	61	57
13C2-PFTeDA (surr.)	1	%	88	66
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	87	92
D3-N-MeFOSA (surr.)	1	%	167	136
D5-N-EtFOSA (surr.)	1	%	127	152
D7-N-MeFOSE (surr.)	1	%	87	73
D9-N-EtFOSE (surr.)	1	%	81	77
D5-N-EtFOSAA (surr.)	1	%	60	51
D3-N-MeFOSAA (surr.)	1	%	61	52
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01

Client Sample ID			0089_QC216_230607	0089_QC218_230607
Sample Matrix			Water	Water
Eurofins Sample No.			L23-Jn0022042	L23-Jn0022044
Date Sampled			Jun 07, 2023	Jun 07, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonic acids (PFSAs)				
13C3-PFBS (surr.)	1	%	102	102
18O2-PFHxS (surr.)	1	%	79	84
13C8-PFOS (surr.)	1	%	66	71
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	101	96
13C2-6:2 FTSA (surr.)	1	%	76	74
13C2-8:2 FTSA (surr.)	1	%	64	56
13C2-10:2 FTSA (surr.)	1	%	64	50
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Jun 13, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Jun 13, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Jun 13, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Jun 13, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Jun 09, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 997465
Phone: [redacted]
Fax:

Received: Jun 8, 2023 9:35 AM
Due: Jun 15, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_230606	Jun 06, 2023		Water	L23-Jn0022027		X
2	0089_QC202_230606	Jun 06, 2023		Water	L23-Jn0022028		X
3	0089_QC203_230606	Jun 06, 2023		Water	L23-Jn0022029		X
4	0089_QC204_230606	Jun 06, 2023		Water	L23-Jn0022030		X
5	0089_QC205_230606	Jun 06, 2023		Water	L23-Jn0022031		X
6	0089_QC206_230606	Jun 06, 2023		Water	L23-Jn0022032		X
7	0089_QC207_230606	Jun 06, 2023		Soil	L23-Jn0022033	X	X
8	0089_QC208_230606	Jun 06, 2023		Water	L23-Jn0022034		X

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Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 997465
Phone: [redacted]
Fax:

Received: Jun 8, 2023 9:35 AM
Due: Jun 15, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0089_QC209_230606	Jun 06, 2023		Water	L23-Jn0022035		X
10	0089_QC210_230607	Jun 07, 2023		Water	L23-Jn0022036		X
11	0089_QC211_230607	Jun 07, 2023		Water	L23-Jn0022037		X
12	0089_QC212_230607	Jun 07, 2023		Water	L23-Jn0022038		X
13	0089_QC213_230607	Jun 07, 2023		Soil	L23-Jn0022039	X	X
14	0089_QC214_230607	Jun 07, 2023		Soil	L23-Jn0022040	X	X
15	0089_QC215_230607	Jun 07, 2023		Water	L23-Jn0022041		X
16	0089_QC216_230607	Jun 07, 2023		Water	L23-Jn0022042		X
17	0089_QC217_230607	Jun 07, 2023		Soil	L23-Jn0022043	X	X
18	0089_QC218_	Jun 07, 2023		Water	L23-Jn0022044		X

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Received: Jun 8, 2023 9:35 AM
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Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
18	0089_QC218_230607	Jun 07, 2023		Water	L23-Jn0022044		
Test Counts						4	18

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	98			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	86			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	83			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	88			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	95			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	112			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	103			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	97			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	93			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	80			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	89			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	81			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	89			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	72			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	126			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	96			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	97			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	88			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	77			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	89			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	105			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	89			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	97			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	92			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	101			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	88			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	100			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	105			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	97			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L23-Jn0022032	CP	%	102			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L23-Jn0022032	CP	%	84			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L23-Jn0022032	CP	%	85			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L23-Jn0022032	CP	%	87			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L23-Jn0022032	CP	%	94			50-150	Pass	
Perfluorononanoic acid (PFNA)	L23-Jn0022032	CP	%	117			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L23-Jn0022032	CP	%	105			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L23-Jn0022032	CP	%	106			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L23-Jn0022032	CP	%	96			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L23-Jn0022032	CP	%	71			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L23-Jn0022032	CP	%	95			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L23-Jn0022032	CP	%	83			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L23-Jn0022032	CP	%	99			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L23-Jn0022032	CP	%	74			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L23-Jn0022032	CP	%	144			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L23-Jn0022032	CP	%	101			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L23-Jn0022032	CP	%	101			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L23-Jn0022032	CP	%	90			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L23-Jn0022032	CP	%	77			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L23-Jn0022032	CP	%	94			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L23-Jn0022032	CP	%	98			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L23-Jn0022032	CP	%	95			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L23-Jn0022032	CP	%	92			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L23-Jn0022032	CP	%	95			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	L23-Jn0022032	CP	%	94			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L23-Jn0022032	CP	%	88			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L23-Jn0022032	CP	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L23-Jn0022032	CP	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L23-Jn0022032	CP	%	107			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L23-Jn0022032	CP	%	97			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L23-Jn0022032	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L23-Jn0022032	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L23-Jn0022032	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L23-Jn0022032	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L23-Jn0022032	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L23-Jn0022032	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L23-Jn0022032	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L23-Jn0022032	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L23-Jn0022032	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L23-Jn0022032	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS
[redacted] Senior Analyst-PFAS

[redacted]
[redacted]
General Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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APPENDIX

D

FIELD RECORDS & CALIBRATION CERTIFICATES

Cardno

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Monitoring Date	Monitoring Area	Monitoring Location ID	Sample ID	Screen Interval (mbgl)	TOC (mAHD)	Well Depth (mbgl)	SWL (mbTOC)	RWL (mAHD)	Observations
6/06/2023	Fire Training Area	MW109	0089_MW109_230606	2.5-5.5_	4.446	5.5	3.87	0.576	YSI failure
6/06/2023	Fire Training Area	MW112	0089_MW112_230606	3.0 - 6.0	3.973	6.0	3.37	0.603	YSI failure
6/06/2023	Fire Training Area	MW120	0089_MW120_230606	2.5-5.5_	4.409	5.5	3.82	0.589	YSI failure
6/06/2023	Fire Training Area	MW121	0089_MW121_230606	2.7-5.7_	3.7	5.7			No SWL recorded, bore purged and bailed, YSI failure
6/06/2023	Fire Training Area	MW123	0089_MW123_230606	4.5-8_	6.62	8.0	6.125	0.495	YSI failure, no field parameters
7/06/2023	Fire Training Area	MW124	0089_MW124_230607	0.75-4_	1.899	4.0	1.17	0.729	
7/06/2023	Fire Training Area	MW125	0089_MW125_230607	0.9-3.9_	1.882	3.9	1.26	0.622	
7/06/2023	Fire Training Area	MW126	0089_MW126_230607	0.9-3.9_	1.948	3.9	1.26	0.688	
7/06/2023	Fire Training Area	MW127	0089_MW127_230607	0.9-3.9_	1.771	3.9	1.26	0.511	
7/06/2023	Fire Training Area	MW128	0089_MW128_230607	2.5-5.5_	4.537	5.5	4.08	0.457	Cleared with steel bailer
7/06/2023	Demolition Ground	MW139	0089_MW139_230607	2-5_	2.273	5.0	1.789	0.484	
7/06/2023	Demolition Ground	MW141	0089_MW141_230607	2-5_	3.025	5.0	2.464	0.561	
7/06/2023	Demolition Ground	MW142	0089_MW142_230607	0.25-4_	2.573	4.0	2.01	0.563	
7/06/2023	Demolition Ground	MW147	0089_MW147_230607	2-5_	3.423	5.2	2.895	0.528	
7/06/2023	Demolition Ground	MW149	0089_MW149_230607	1-4_	2.303	4.0	1.76	0.543	
6/06/2023	Waste Water Treatment Plant	MW158	0089_MW158_230606	NA	14.541	15.82	13.98	0.561	YSI failure
6/06/2023	Waste Water Treatment Plant	MW161	0089_MW161_230606	NA	17.225	18.13	16.42	0.805	YSI failure
6/06/2023	Waste Water Treatment Plant	MW166	0089_MW166_230606	10-13_	11.89	13.0	11.03	0.86	YSI failure
6/06/2023	Waste Water Treatment Plant	MW171	0089_MW171_230606	28.5-31.5_	29.238	31.5	28.58	0.658	YSI failure
6/06/2023	Waste Water Treatment Plant	MW172	0089_MW172_230606	-0_	16.772	26.0	16.22	0.552	YSI failure
6/06/2023	Waste Water Treatment Plant	MW173	0089_MW173_230606	NA	10.08	11.11	9.387	0.693	
6/06/2023	Waste Water Treatment Plant	MW193	0089_MW193_230606	10.5-13.5_	11.86	13.5	11.037	0.823	
6/06/2023	Waste Water Treatment Plant	MW195D	0089_MW195D_230606	10-13_	4.363	13.0	3.958	0.405	
6/06/2023	Waste Water Treatment Plant	MW195S	0089_MW195S_230606	3.5-6.5_	4.571	6.5	3.405	1.166	
6/06/2023	Waste Water Treatment Plant	MW196	0089_MW196_230606	NA	12.75	13.8	12.38	0.37	YSI failure
7/06/2023		MW197	0089_MW197_230607	NA	2.28	NA	1.89	0.39	
6/06/2023	Waste Water Treatment Plant	MW199	0089_MW199_230606	NA	11.8	NA	11.334	0.466	
7/06/2023	Waste Water Treatment Plant	MW200	0089_MW200_230607	NA	2.07	NA	1.72	0.35	
7/06/2023	Waste Water Treatment Plant	MW202	0089_MW202_230607	NA	2.12	NA	1.532	0.588	
6/06/2023	Waste Water Treatment Plant	MW203	0089_MW203_230606	NA	10.855	12.9	10.446	0.409	
8/06/2023	Helicopter Support Facility	MW214	0089_MW214_230608	5.5-9_	8.075	9.0	7.608	0.467	
8/06/2023	Helicopter Support Facility	MW215	0089_MW215_230608	1.5-4.5_	3.794	4.5	3.429	0.365	
8/06/2023	Helicopter Support Facility	MW216	0089_MW216_230608	6-9_	8.329	6.0	7.825	0.504	
8/06/2023	AVCAT Storage and Fuel Farm	MW217	0089_MW217_230608	6.5-9.5_	8.847	9.5	8.23	0.617	
8/06/2023	Helicopter Support Facility	MW220	0089_MW220_230608	NA	NA	NA	6.23		
8/06/2023	Helicopter Support Facility	MW224	0089_MW224_230608	11.25-14.25_	13.372	14.25	12.33	1.042	
8/06/2023	Helicopter Support Facility	MW225	0089_MW225_230608	2-5_	4.066	5.0	3.759	0.307	
8/06/2023	Helicopter Support Facility	MW226	0089_MW226_230608	0.75-3.8_	1.749	3.8	1.5	0.249	
8/06/2023	Helicopter Support Facility	MW227	0089_MW227_230608	1.25-4.2_	2.961	4.2	2.725	0.236	
8/06/2023	Helicopter Support Facility	MW228	0089_MW228_230608	0.75-3.75_	2.23	3.75	1.945	0.285	
6/06/2023	AVCAT Storage and Fuel Farm	MW233	0089_MW233_230606	NA	3.705	4.968			
6/06/2023	AVCAT Storage and Fuel Farm	MW236	0089_MW236_230606	NA	4.642	5.66	4.12	0.522	YSI not working
7/06/2023	AVCAT Storage and Fuel Farm	MW238	0089_MW238_230607	NA	4.827	NA	4.31	0.517	YSI not working
7/06/2023	AVCAT Storage and Fuel Farm	MW239	0089_MW239_230607	NA	4.03	NA	3.53	0.5	YSI Not working
7/06/2023	AVCAT Storage and Fuel Farm	MW240	0089_MW240_230607	NA	4.483	6.8	3.95	0.533	YSI Not working
6/06/2023	AVCAT Storage and Fuel Farm	MW242	0089_MW242_230606	NA	3.539	4.76	3.01	0.529	YSI failure

Monitoring Date	Monitoring Area	Monitoring Location ID	Sample ID	Screen Interval (mbgl)	TOC (mAHD)	Well Depth (mbgl)	SWL (mbTOC)	RWL (mAHD)	Observations
7/06/2023	AVCAT Storage and Fuel Farm	MW243	0089_MW243_230607	NA	4.892	7.0	4.33	0.562	YSI Not working
7/06/2023	AVCAT Storage and Fuel Farm	MW245	0089_MW245_230607	NA	4.551	5.65	3.88	0.671	YSI not working
6/06/2023	AVCAT Storage and Fuel Farm	MW249	0089_MW249_230606	3.5-6.5_	5.227	6.5	4.85	0.377	
6/06/2023	Fire Station, Flammable/Hazardous Good	MW255	0089_MW255_230606	3-6_	4.609	6.0	4.23	0.379	
6/06/2023	Fire Station, Flammable/Hazardous Good	MW256	0089_MW256_230606	3-6_	3.84	6.0	3.26	0.58	
6/06/2023	Fire Station, Flammable/Hazardous Good	MW257	0089_MW257_230606	2.7-5.7_	3.806	5.7	3.225	0.581	
6/06/2023	Fire Station, Flammable/Hazardous Good	MW258	0089_MW258_230606	3-6_	4.043	6.0	3.472	0.571	
6/06/2023	Fire Station, Flammable/Hazardous Good	MW259	0089_MW259_230606	2.5-5.5_	3.8	5.5	3.23	0.57	
6/06/2023	Dredge Spoil / Careening Bay	MW268	0089_MW268_230606	2.5-5.5_	4.056	5.5	3.5	0.556	
6/06/2023	Dredge Spoil / Careening Bay	MW269	0089_MW269_230606	2.5-5.5_	4.153	5.5	3.58	0.573	
8/06/2023	Helicopter Support Facility	MW282	0089_MW282_230608	4.5-7.5_	5.78	7.5	5.2	0.58	
7/06/2023	AVCAT Storage and Fuel Farm	MW288	0089_MW288_230607	2.25-5.25_	4.003	5.25	3.52	0.483	YSI Not working
6/06/2023	Accommodation Area	MW289	0089_MW289_230606	3.25-6.25_	4.495	6.25	3.858	0.637	
6/06/2023	AVCAT Storage and Fuel Farm	MW496	0089_MW496_230606	3.5-8_	5.092	8.0	4.96	0.132	
6/06/2023	Fire Training Area	MW500	0089_MW500_230606	2-6.5_	3.692	6.5	3.075	0.617	YSI failure
6/06/2023	AVCAT Storage and Fuel Farm	MW516	0089_MW516_230606	4.5-7.5_	6.37	7.5	5.93	0.44	

Table D1 - Groundwater Field Parameters

Monitoring Location ID	Sampling Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	R2 - Temp (°C)	R2 - DO (mg/L)	R2 - EC (us/Cm)	R2 - TDS	R2 - pH	R2 - Eh (mV)
MW109	HydraSleeve												
MW112	HydraSleeve												
MW120	HydraSleeve												
MW121	HandBailing												
MW123	HydraSleeve												
MW124	HydraSleeve	18.7	1.55	39032	25370	7.33	-179.8						
MW125	HydraSleeve	19.4	1.28	41227	26795	7.23	-234.9						
MW126	HydraSleeve	19.4	1.08	33877	22021	7.08	-270.5						
MW127	HydraSleeve	20	0.74	37641	24469	7.09	-262.1						
MW128	HandBailing	18.6	2.68	869	565	7.67	-53.6	18.5	2.64	869	565	7.67	-54.6
MW139	HydraSleeve	18.9	1.42	7740	5031	7.5	-27.9						
MW141	HydraSleeve	18.2	1.15	32792	21323	7.08	-218.5						
MW142	HydraSleeve	18.1	1.45	36490	23724	7.03	-41						
MW147	HydraSleeve	17.2	2.24	22197	14430	7.1	-180.2						
MW149	HydraSleeve	17.8	1.76	50393	32751	7.32	-15.1						
MW158	HydraSleeve												
MW161	HydraSleeve												
MW166	HydraSleeve												
MW171	HydraSleeve												
MW172	HydraSleeve												
MW173	HydraSleeve	17.7	1.85	3760	2444	7.2	80.6						
MW193	HydraSleeve	18.1	2.15	3676	2390	7.37	-11.4						
MW195D	HydraSleeve	17.7	0.94	32740	21281	7.45	-126.6						
MW195S	HydraSleeve	17.7	1.76	4148	2697	7.08	0.4						
MW196	HydraSleeve												
MW197	HydraSleeve	19	1.55	10714	6965	7.45	78.4						
MW199	HydraSleeve	18.5	2.05	2641	1717	7.32	99.3						
MW200	HydraSleeve	18.8	1.56	10704	6958	7.45	78.9						
MW202	HydraSleeve	26.9	1.15	2438	1585	7.63	13.4						
MW203	HydraSleeve	19.2	2.57	1061	689	7.51	127.6						
MW214	HydraSleeve	18.7	1.77	3370	2190	7.29	-135.3						
MW215	HydraSleeve	18.9	1.64	2907	1892	7.27	-127.6						
MW216	HydraSleeve	18.8	1.67	4647	3022	7.34	3						
MW217	HydraSleeve	19.3	5.11	795	516	7.4	71.6						
MW220	HydraSleeve	18.7	1.89	803	522	7.43	60.8						
MW224	HydraSleeve	18.2	5.81	885	575	7.75	65.3						
MW225	HydraSleeve	19.2	1.9	4700	3059	7.25	-131.5						
MW226	HydraSleeve	19.8	0.75	43015	27963	7.09	-152.1						
MW227	HydraSleeve	18.7	0.98	3721	2418	7.43	-226.4						
MW228	HydraSleeve	19	0.81	12206	7934	7.32	-154.7						
MW233	HydraSleeve	14.1	3.73	274	178.1	8.28	17.8						
MW236	HandBailing	18.4	2.59	738	477	7.59	141.8	18.1	2.62	734	477	7.59	-141.4
MW238	HydraSleeve												
MW239	HydraSleeve												
MW240	HydraSleeve												
MW242	HydraSleeve												

Table D1 - Groundwater Field Parameters

Monitoring Location ID	Sampling Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	R2 - Temp (°C)	R2 - DO (mg/L)	R2 - EC (us/Cm)	R2 - TDS	R2 - pH	R2 - Eh (mV)
MW243	HydraSleeve												
MW245	HydraSleeve												
MW249	HydraSleeve	17.3	0.87	1312	853	7.38	-146.9						
MW255	HydraSleeve	18.3	0.79	794	516	7.55	-155.5						
MW256	HydraSleeve	16.2	0.71	1621	1054	7.12	-222.6						
MW257	HydraSleeve	18.4	5.83	373.2	242.6	7.89	-111.1						
MW258	HydraSleeve	19.7	2.1	1799	1170	7.12	-137.3						
MW259	HydraSleeve	16.7	2.96	547	355.5	7.59	-135						
MW268	HydraSleeve	18.3	2.17	7794	5067	7.32	-164.5						
MW269	HydraSleeve	17.3	1.09	1717	1116	7.58	-194.1						
MW282	HydraSleeve	18.6	3.66	1103	717	7.01	0.989						
MW288	HydraSleeve												
MW289	HydraSleeve	18.7	2.87	981	638	7.52	-49.2						
MW496	HandBailing	16.4	1.01	1577	1025	7.5	-202.7	16.3	1.01	1578	1025	7.5	-202.2
MW500	HydraSleeve												
MW516	HydraSleeve	17.2	1.88	644	418.8	7.35	-164.8						

Monitoring Location ID	R3 - Temp (°C)	R3 - DO (mg/L)	R3 - EC (us/Cm)	R3 - TDS (mg/L)	R3 - pH	R3 - Eh (mV)	QC Dup Sample #	Odour	Odour Comments	colour
MW109								no		Clear
MW112							QC104/204	no		Clear
MW120							QC103/203	no		Clear
MW121								no		Cloudy
MW123							QC101/201	yes	Slight sulfur	Cloudy
MW124								no		Clear
MW125								no		Clear
MW126								no		Clear
MW127								no		Clear
MW128	18.5	2.63	868	565	7.67	-51.4		no		Cloudy, Milky water
MW139							QC110/210	no		Clear
MW141								no		Clear
MW142								no		Clear
MW147								no		Clear
MW149								no		Clear
MW158								no		Cloudy
MW161								no		Cloudy
MW166								no		Cloudy
MW171								no		Clear
MW172								no		Clear
MW173								no		Clear
MW193								no		Clear
MW195D								no		Clear
MW195S							QC109/209	no		Clear
MW196								no		Cloudy
MW197								no		Cloudy
MW199							QC106/206	no		Clear
MW200								no		Cloudy
MW202								no		Clear
MW203								no		Clear
MW214								no		Clear
MW215								no		Clear
MW216								no		Clear
MW217								no		Clear
MW220								no		Clear
MW224								no		Clear
MW225								no		Clear
MW226								no		Clear
MW227								no		Clear
MW228								no		Clear
MW233								no		Clear
MW236	18	2.58	734	477	7.59	-141.4		no		Clear
MW238								no		Clear
MW239								no		Clear
MW240								no		Clear
MW242								no		Cloudy

Table D1 - Groundwater Field Parameters

Monitoring Location ID	R3 - Temp (°C)	R3 - DO (mg/L)	R3 - EC (us/Cm)	R3 - TDS (mg/L)	R3 - pH	R3 - Eh (mV)	QC Dup Sample #	Odour	Odour Comments	colour
MW243								no		Clear
MW245								no		Clear
MW249								no		Clear
MW255								no		Clear
MW256								no		Clear
MW257								no		Clear
MW258								no		Cloudy
MW259							QD102/202	no		Cloudy
MW268								no		Clear
MW269								no		Clear
MW282								no		Clear
MW288								no		Clear
MW289								no		Clear
MW496	16.3	1.01	1578	1025	7.5	-201.8		no		Clear
MW500								no		Clear
MW516								no		Clear

Monitoring Date	Monitoring Location	Sample_ID	Sampling Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Comments	QC Dup Sample #	Odour	Colour
7/06/2023	PW304	0089_PW304_230607	Peristaltic Pump							YSI Not working		no	Brown
8/06/2023	PW306	0089_PW306_230608	Peristaltic Pump	16	4.32	53040	34800	7.55	54.5			no	Clear
8/06/2023	PW307	0089_PW307_230608	Peristaltic Pump	15.8	4.87	53400	33900	7.55	54.8			no	Clear
8/06/2023	PW308	0089_PW308_230608	Peristaltic Pump	16	4.58	54204	33480	7.55	48			no	Clear
8/06/2023	PW314	0089_PW314_230608	Peristaltic Pump	15.9	4.2	53028	33900	7.55	58.2			no	Clear
8/06/2023	PW315	0089_PW315_230608	Peristaltic Pump	16	4.1	53040	34750	7.5	50.3			no	Clear
8/06/2023	PW316	0089_PW316_230608	Peristaltic Pump	16	4.51	54008	34503	7.49	60.1			no	Clear
7/06/2023	PW329	0089_PW329_230607	Peristaltic Pump	21.4	2.05	54205	35251	7.33	66.4			no	Clear
7/06/2023	PW330	0089_PW330_230607	Peristaltic Pump	16.4	4.54	52412	34066	7.78	72			no	Clear
7/06/2023	PW331	0089_PW331_230607	Peristaltic Pump	21.7	1.97	54701	35575	7.32	63.4			no	Clear
7/06/2023	PW335	0089_PW335_230607	Peristaltic Pump	15.3	5.67	48516	31528	7.68	24			no	Clear
7/06/2023	PW340	0089_PW340_230607	Peristaltic Pump	15	1.64	48214	31339	7.7	-36.1			no	Clear
7/06/2023	PW341	0089_PW341_230607	Peristaltic Pump	15.7	4.87	47646	30941	7.77	-42.7			no	Clear
7/06/2023	PW345	0089_PW345_230607	Peristaltic Pump	15.5	4.96	48591	31583	7.66	102.8			no	Cloudy
7/06/2023	PW346	0089_PW346_230607	Peristaltic Pump							YSI Not working		no	Brown,Cloudy
7/06/2023	PW350	0089_PW350_230607	Peristaltic Pump	18	4.12	54119	35245	8.01	74.3			no	Clear
7/06/2023	PW351	0089_PW351_230607	Peristaltic Pump	18.5	4.91	53941	35601	8.07	86.2			no	Clear
7/06/2023	PW352	0089_PW352_230607	Peristaltic Pump	18.2	4.1	53471	35902	8.05	74.2			no	Clear
7/06/2023	PW356	0089_PW356_230607	Peristaltic Pump	21.8	2.08	53470	34814	7.34	69.2		QC116/216	no	Clear
7/06/2023	PW357	0089_PW357_230607	Peristaltic Pump	16.3	4.81	52530	34143	7.76	70.6			no	Clear
7/06/2023	PW358	0089_PW358_230607	Peristaltic Pump	19.6	4.37	52294	33988	7.78	73.6			no	Clear
7/06/2023	PW362	0089_PW362_230607	Peristaltic Pump	14.9	1.7	48227	31347	7.7	-30.1			no	Clear
7/06/2023	PW363	0089_PW363_230607	Peristaltic Pump	16.2	4.55	52841	34350	7.95	-119.3			no	Clear
7/06/2023	PW364	0089_PW364_230607	Peristaltic Pump	15.8	2.32	52452	34092	7.8	110.8		QC118/218	no	Cloudy
7/06/2023	PW367	0089_PW367_230607	Peristaltic Pump	15.9	4.92	38086	24757	7.3	111.1		QC111/211	no	Cloudy,Brown
7/06/2023	PW368	0089_PW368_230607	Peristaltic Pump							YSI Not working		no	Brown
7/06/2023	PW369	0089_PW369_230607	Peristaltic Pump	15.4	5.46	48690	31647	7.66	103			no	Cloudy
6/06/2023	PW374	0089_PW374_230606	Peristaltic Pump	13.7	5.18	54879	35672	7.94	-128.3		QC108/208	no	Clear
6/06/2023	PW375	0089_PW375_230606	Peristaltic Pump	14	5.35	53458	34754	7.81	-129			no	Clear
6/06/2023	PW378	0089_PW378_230606	Peristaltic Pump	13.7	4.51	53916	35045	7.81	-124.7			no	Clear
7/06/2023	PW380	0089_PW380_230607	Peristaltic Pump	18.2	3.59	53419	34924	7.84	-103.1			no	Clear
7/06/2023	PW381	0089_PW381_230607	Peristaltic Pump	18.4	4.08	53945	35620	8.02	84.2			no	Clear
7/06/2023	PW401	0089_PW401_230607	Peristaltic Pump	17.9	4.5	54022	35115	8	82.7			no	Clear
8/06/2023	PW405	0089_PW405_230608	Peristaltic Pump	15.3	4.06	52170	33900	7.85	-106.7			no	Clear
8/06/2023	PW407	0089_PW407_230608	Peristaltic Pump	15.3	4.22	51770	33301	7.84	-105.9			no	Clear
8/06/2023	PW409	0089_PW409_230608	Peristaltic Pump	15.1	5.59	19386	12601	7.79	-113.1			no	Cloudy
8/06/2023	PW411	0089_PW411_230608	Peristaltic Pump	17.5	6.51	52476	34111	7.88	83.4			no	Clear
8/06/2023	PW413	0089_PW413_230608	Peristaltic Pump	17.5	5.13	52509	34124	7.87	83.9			no	Clear
8/06/2023	PW415	0089_PW415_230608	Peristaltic Pump	17.6	4.71	52447	34090	7.6	84.4			no	Clear

Monitoring Area	Monitoring Location	Date	Sample ID	Sampling Method	WaterBody Depth Sample Depth (m)	(m)	QC Dup #	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Colour	Turbidity	Comments
Fire Training Area	SW130	7/06/2023	0089_SW130_230607	Direct into Bottle	0.1	1.0		16.5	6.03	53503	34779	8.06	-7.4	Clear	Low	
Fire Training Area	SW132	7/06/2023	0089_SW132_230607	Direct into Bottle	0.1	1.0		17	5.43	53231	34598	8.04	-37.3	Clear	Low	
Fire Training Area	SW134	7/06/2023	0089_SW134_230607	Direct into Bottle	0.1	1.0		17.7	1.23	28234	18353	8.02	-160.6	Clear	Low	
Demolition Ground	SW150	7/06/2023	0089_SW150_230607	Direct into Bottle	0.1	1.0	QC115/215	16.1	4.8	57150	37275	8	27.7	Clear	High	
Demolition Ground	SW152	7/06/2023	0089_SW152_230607	Direct into Bottle	0.1	1.0		16.4	3.97	60443	37036	8.03	44.8	Clear	High	
Demolition Ground	SW154	7/06/2023	0089_SW154_230607	Direct into Bottle	0.1	1.0		19.6	3.53	67107	43591	7.97	43.2	Clear	High	
Demolition Ground	SW156	7/06/2023	0089_SW156_230607	Direct into Bottle	0.1	1.0		19.5	2.92	68610	44599	7.96	56.2	Clear	High	
Waste Water Treatment Plant East	SW305	7/06/2023	0089_SW305_230607	Direct into Bottle	0.1	1.0								Clear	Low	YSI Not working
Helicopter Support Facility	SW309	8/06/2023	0089_SW309_230608	Direct into Bottle	0.2	1.0		17.9	4.72	53313	34653	7.94	43.6	Clear	High	
Helicopter Support Facility	SW310	8/06/2023	0089_SW310_230608	Direct into Bottle	0.2	1.0		17.5	4.54	53149	35240	7.96	43.6	Clear	High	
Helicopter Support Facility	SW311	8/06/2023	0089_SW311_230608	Direct into Bottle	0.2	1.0		18	4.52	53782	35274	8	42.7	Clear	Low	
Dredge Spoil / Careening Bay	SW317	6/06/2023	0089_SW317_230606	Direct into Bottle	0.1	1.0		14.3	5.4	54524	35453	8.14	-130	Clear	High	
Dredge Spoil / Careening Bay	SW318	6/06/2023	0089_SW318_230606	Direct into Bottle	0.1	1.0		14.6	5.98	54216	35242	8.13	-133.1	Clear	High	
Dredge Spoil / Careening Bay	SW319	6/06/2023	0089_SW319_230606	Direct into Bottle	0.1	1.0	QC105/205	14.8	5.47	54529	35447	8.1	-120.9	Clear	High	
Waste Water Treatment Plant West	SW353	7/06/2023	0089_SW353_230607	Direct into Bottle	0.2	1.0		18.9	3.96	53706	34908	8.13	80.8	Clear	High	
Waste Water Treatment Plant East	SW370	7/06/2023	0089_SW370_230607	Direct into Bottle	0.1	1.0	QC112/212	14.7	5.34	52834	34343	7.93	90.7	Cloudy	Medium	
Waste Water Treatment Plant East	SW371	7/06/2023	0089_SW371_230607	Direct into Bottle	0.1	1.0								Clear	Low	YSI Not working
Waste Water Treatment Plant East	SW372	7/06/2023	0089_SW372_230607	Direct into Bottle	0.1	1.0								Clear	Medium	YSI Not working
Waste Water Treatment Plant East	SW373	7/06/2023	0089_SW373_230607	Direct into Bottle	0.1	1.0								Clear	High	YSI Not working
Waste Water Treatment Plant West	SW382	7/06/2023	0089_SW382_230607	Direct into Bottle	0.1	1.0		18.6	4.38	53968	35677	8.07	83.7	Clear	Low	
Waste Water Treatment Plant West	SW383	7/06/2023	0089_SW383_230607	Direct into Bottle	0.1	1.0		18.6	4.78	53978	35082	8.12	83.5	Clear	High	
Waste Water Treatment Plant West	SW384	7/06/2023	0089_SW384_230607	Direct into Bottle	0.1	1.0		18.5	4.02	53075	35715	8	81.6	Clear	Low	
Helicopter Support Facility	SW406	8/06/2023	0089_SW406_230608	Direct into Bottle	0.1	1.0		15.2	4.76	52737	34280	7.93	-101.3	Clear	Low	
Helicopter Support Facility	SW408	8/06/2023	0089_SW408_230608	Direct into Bottle	0.1	1.0		15.1	5.23	52646	34229	7.92	-93.3	Clear	Low	
Helicopter Support Facility	SW410	8/06/2023	0089_SW410_230608	Direct into Bottle	0.1	1.0		15.4	5.94	50949	33117	8.01	-110.9	Clear	Low	
Helicopter Support Facility	SW412	8/06/2023	0089_SW412_230608	Direct into Bottle	0.1	1.0		17.5	5.59	54092	35160	8.02	-103.3	Clear	Low	
Helicopter Support Facility	SW414	8/06/2023	0089_SW414_230608	Direct into Bottle	0.1	1.0		17.8	6	54040	35126	8.04	-110.4	Clear	Low	
Helicopter Support Facility	SW416	8/06/2023	0089_SW416_230608	Direct into Bottle	0.1	1.0		17.7	6.01	54087	35156	8.01	-110.2	Clear	Low	

Monitoring Area	Monitoring Location	Date	Sample ID	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description	QC Dup #
Waste Water Treatment Plant East	SD304	7/06/2023	0089_SD304_230607	0.3	Shovel, Trowel	Wet	SAND: Yellow, fine to medium grained, sub rounded	
Helicopter Support Facility	SD306	8/06/2023	0089_SD306_230608	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded	
Helicopter Support Facility	SD307	8/06/2023	0089_SD307_230608	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded	
Helicopter Support Facility	SD308	8/06/2023	0089_SD308_230608	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded	
Helicopter Support Facility	SD314	8/06/2023	0089_SD314_230608	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded	
Helicopter Support Facility	SD315	8/06/2023	0089_SD315_230608	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded	
Helicopter Support Facility	SD316	8/06/2023	0089_SD316_230608	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded	
Demolition Ground	SD329	7/06/2023	0089_SD329_230607	0.2	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded	
Demolition Ground	SD330	7/06/2023	0089_SD330_230607	0.2	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded	
Demolition Ground	SD331	7/06/2023	0089_SD331_230607	0.2	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded	
Fire Training Area	SD335	7/06/2023	0089_SD335_230607	0.5	Shovel, Trowel	Wet	SAND: yellow, fine to medium grained, sub rounded	
Fire Training Area	SD340	7/06/2023	0089_SD340_230607	0.5	Shovel, Trowel	Wet	Grey sand	
Fire Training Area	SD341	7/06/2023	0089_SD341_230607	0.5	Shovel, Trowel	Wet	SAND: Yellow, fine to medium grained, sub rounded	
Waste Water Treatment Plant East	SD345	7/06/2023	0089_SD345_230607	0.8	Shovel, Trowel	Wet	Grey sand trace seaweed	
Waste Water Treatment Plant East	SD346	7/06/2023	0089_SD346_230607	0.5	Shovel, Trowel	Wet	SAND: yellow, fine to medium grained, sub rounded	
Waste Water Treatment Plant West	SD350	7/06/2023	0089_SD350_230607	0.5	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded	
Waste Water Treatment Plant West	SD351	7/06/2023	0089_SD351_230607	0.5	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded	
Waste Water Treatment Plant West	SD352	7/06/2023	0089_SD352_230607	0.5	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded	
Demolition Ground	SD356	7/06/2023	0089_SD356_230607	0.2	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded	QC114/214
Demolition Ground	SD357	7/06/2023	0089_SD357_230607	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded	
Demolition Ground	SD358	7/06/2023	0089_SD358_230607	0.2	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded	
Fire Training Area	SD362	7/06/2023	0089_SD362_230607	0.8	Shovel, Trowel	Wet	Grey sand	
Fire Training Area	SD363	7/06/2023	0089_SD363_230607	0.5	Shovel, Trowel	Wet	SAND: Yellow, fine to medium grained, sub rounded	
Fire Training Area	SD364	7/06/2023	0089_SD364_230607	0.3	Shovel, Trowel	Wet	SAND: Yellow, fine to medium grained, sub rounded	QC117/217
Waste Water Treatment Plant East	SD367	7/06/2023	0089_SD367_230607	1	Shovel, Trowel	Wet	Beige sand, trace seaweed	
Waste Water Treatment Plant East	SD368	7/06/2023	0089_SD368_230607	0.5	Shovel, Trowel	Wet	SAND: yellow, rine to medium grained, sub rounded	
Waste Water Treatment Plant East	SD369	7/06/2023	0089_SD369_230607	0.8	Shovel, Trowel	Wet	Grey sand trace seaweed	QC113/213
Dredge Spoil / Careening Bay	SD374	6/06/2023	0089_SD374_230606	0.3	Shovel, Trowel	Wet	Sand: yellow mottled white, medium to coarse grained, sub rounded to sub anu	QC107/207
Dredge Spoil / Careening Bay	SD375	6/06/2023	0089_SD375_230606	0.3	Shovel, Trowel	Wet	SAND: yellow mottled white, medium to coarse grained, sub-rounded to sub angular	
Dredge Spoil / Careening Bay	SD378	6/06/2023	0089_SD378_230606	0.3	Shovel, Trowel	Wet	SAND: yellow mottled white, mediym to coarse grained, sub-rounded to sub-angular	
Waste Water Treatment Plant West	SD380	7/06/2023	0089_SD380_230607	0.5	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded	
Waste Water Treatment Plant West	SD381	7/06/2023	0089_SD381_230607	0.5	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded	
Waste Water Treatment Plant West	SD401	7/06/2023	0089_SD401_230607	0.5	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded	
Helicopter Support Facility	SD405	8/06/2023	0089_SD405_230608	0.8	Shovel, Trowel	Wet	Beige sand	
Helicopter Support Facility	SD407	8/06/2023	0089_SD407_230608	0.5	Shovel, Trowel	Wet	Beige sand	
Helicopter Support Facility	SD409	8/06/2023	0089_SD409_230608	0.5	Shovel, Trowel	Wet	Beige sand	
Helicopter Support Facility	SD411	8/06/2023	0089SD411230608	0.8	Shovel, Trowel	Wet	SAND:Yellow fine to mediun grained, sub rounded	
Helicopter Support Facility	SD413	8/06/2023	0089_SD413_230608	0.8	Shovel, Trowel	Wet	SAND: yellow, fine to medium grained, sub rounded	
Helicopter Support Facility	SD415	8/06/2023	0089_SD415_230608	0.8	Shovel, Trowel	Wet	SAND: yellow, fine to medium grained, sub rounded	

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 22H102051
Cable length: 1m (22B100428)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	172.30 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.36
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 12 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (22D100150)	Check Temp NATA	Room Temp	17.1	-0.1	°C	NA	17	°C
pH (22M)	pH 7.00	392512	7.01	-5.30	mV	7.05	7.01	pH
pH (22M)	pH 4.00	394799	4.00	167.00	mV	4.01	4.00	pH
Conductivity (22D100150)	2764 µs/cm at 25°C	21/1012	2764	GLP	5.06	2774	2764	µs/cm
ORP (22J)	Zobell A & B	23/1101	247	247	mV	235.5	234.7	mV
Zero DO (22E100254)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.1	0.0	%
100% DO (22E100254)	100% Air Saturation	Air	100.0	4.3	uA	98.1	100.0	%

Calibrated by: [redacted]

Calibration Date: 05-Jun-23
Next Due: 02-Dec-23

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 22H102060
Cable length: 1m (22B100428)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	171.50 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.08
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 12 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (22D100150)	Check Temp NATA	Room Temp	16.9	-0.1	°C	NA	16.8	°C
pH (22M)	pH 7.00	392512	7.01	-6.90	mV	7.03	7.01	pH
pH (22M)	pH 4.00	394799	4.00	164.60	mV	4.06	4.00	pH
Conductivity (22D100150)	2764 µs/cm at 25°C	21/1012	2764	GLP	5.07	2721	2764	µs/cm
ORP (22J)	Zobell A & B	23/1101	247	247	mV	222.3	235	mV
Zero DO (22J100169)	NaSO3 in distilled water	10175	0.0	NA	NA	0.6	0.0	%
100% DO (22J100169)	100% Air Saturation	Air	100.0	4.4	uA	100	100.0	%

Calibrated by: [redacted]

Calibration Date: 26-May-23
Next Due: 22-Nov-23

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 22C103026
Cable length: 1m (22B100428)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor **housing**	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	171.40 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.06
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 12 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (22B100315)	Check Temp NATA	Room Temp	16.7	0	°C	NA	16.7	°C
pH (22D)	pH 7.00	392512	7.01	-13.90	mV	7.04	7.01	pH
pH (22D)	pH 4.00	394799	4.00	157.50	mV	3.98	4.00	pH
Conductivity (22B100315)	2764 µs/cm at 25°C	21/1012	2764	GLP	5.00	2753	2764	µs/cm
ORP (22B)	Zobell A & B	23/1101	247	247	mV	264.6	235.2	mV
Zero DO (22E100254)	NaSO3 in distilled water	10175	0.0	NA	NA	0.1	0.0	%
100% DO (22E100254)	100% Air Saturation	Air	100.0	4.2	uA	102.1	100.0	%

Calibrated by: [redacted]

Calibration Date: 15-May-23
Next Due: 11-Nov-23

Date of Bump Test	Site ID	Unit Brand/ Model	Ambient Air Oxygen Calibration	Zero % Oxygen Solution Calibration	Standard Concentrations	Ambient Temperature (°C)	Bump Test Reading	Bump Test Readings within ±5%?	Comment	Test by (Name)	(Signature)
6/6/23	0089	YSI 20m # Cardno	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N	YSI reader failure	[redacted]	
6/6/23	0089	YSI #22C103026	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N	13.5	pH 4.00: 4.07 pH 7.00: 7.11 EC: 1417	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
6/6/23	0089	YSI #22H102060	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N	13.3	pH 4.00: 4.07 pH 7.00: 7.03 EC: 1411	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
7/6/23	0089	YSI # 22H102060	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N	9.8	pH 4.00: 4:03 pH 7.00: 7:06 Temp: EC: 1413	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
8/6/23	0089	YSI #22H102051	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N	15	pH 4.00: 4.07 pH 7.00: 7.10 Temp: EC: 1421	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
8/6/23	0089	YSI #22C103026	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N	13.4	pH 4.00: 4.01 pH 7.00: 7.11 Temp: EC: 1418	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
8/6/23	0089	YSI # 22H102060	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N	13.2	pH 4.00: 4.03 pH 7.00: 7.06 Temp: EC: 1418	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			

APPENDIX

E

DATA QUALITY REVIEW

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Data Quality Review
PFAS Ongoing Monitoring Plan
Q2 2023 Monitoring Event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as trip blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

QA/QC Aspects	Evidence & Evaluation
	QA Documentation
Project Quality Plan/Work Plan and Data Quality Objectives	The field investigation was carried out between the 6th and 8th of June 2023 and is generally in accordance with the proposed scope of work, as documented in the SAQP (PFAS OMP SAQP HMAS Stirling, Cardno, May 2023, Rev10) issued to the client and in general compliance with Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling,* NEPM "*National Environment Protection (Assessment of Site Contamination) Measure"* and PFAS NEMP 2.0. A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (PFAS OMP Q2 2023 Factual Report). In addition, a safety, health and environment work method statement (SHEWMS) was also prepared. The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.
	Data Representativeness
Use of Composites	No Composites were used during the investigation
Holding Times	Chain of custody and laboratory reports provide evidence of holding times. Holding times generally complied with required timeframes, with the following exception: ▪ Dissolved Major Cations (EP2307415, EP2307433, EP2307434, EP2307463) – 1 day overdue The holding time exceedance for a minority of results are likely due to the laboratory workload. They are not considered to have adversely impacted the reliability of the results obtained, or the conclusions drawn from this assessment. The samples were chilled in eskies with ice and placed into fridges upon receipt by the laboratory.
Verification of field procedures	The methodology conducted during this investigation is documented in the body of the report and was in general conformance with the SAQP. Non-disposable equipment was decontaminated between sample locations.
Laboratory Reports	The following laboratory reports were considered for this data quality review: ▪ ALS reports: EP2307415, EP2307433, EP2307434, EP2307435, EP2307463, EP2307493, EP2307495, EP2307497, EP2307498, EP2307499 EP2307500, EP2307501, EP2307502, EP2307555, EP2307586, EP2307587, EP2307588 EP2307589, EP2307590, EP2307591, EP2307592, EP2307593 EP2307594. ▪ Eurofins report: 997465

QA/QC Aspects	Evidence & Evaluation

Data Precision & Accuracy

QC sample Frequency

QC sample type	SAQP required frequency	Sample Collected
Blind duplicate	1 in 10 primary samples (10%)	7 for 62 groundwater samples (11.3%) 4 for 39 porewater samples (10.3%) 3 in 27 surface water samples (11.1%) 4 in 39 sediment samples (10.3%)
Interlab duplicate	1 in 10 primary samples (10%)	7 for 62 groundwater samples (11.3%) 4 for 39 porewater samples (10.3%) 3 in 27 surface water samples (11.1%) 4 in 39 sediment samples (10.3%)
Rinsate	1 per field crew per day	9 for 3 days (3 field personnel/day) (100%)
Field Blank	1 per field crew per day	9 for 3 days (3 field personnel/day) (100%)

The required QC frequency was achieved for all sample types.

RPD Acceptance criteria

Magnitude of Results	Acceptable RPD range
< 10 x LOR	No limits
10 – 20 LOR	0% - 50%
> 20 x LOR	0% - 20%

QC Testing – Blind Duplicates (Primary Lab)

Groundwater

- Primary Groundwater Samples Analysed: 62
- Blind Duplicate Samples Analysed: 7

RPDs were within acceptance criteria with the following exceptions:

- QC101 (PFHxS – 36%)
- QC103 (PFHpS – 37%, PFOS – 30%)

These minor RPDs differences are likely due to the low concentrations of analytes under review. This is not considered to have impacted the validity of the interpretation drawn upon this dataset.

Porewater

- Primary porewater Samples Analysed: 39
- Blind Duplicate Samples Analysed: 4

All RPDs were within acceptance criteria with the following exception:

- QC108 (PFOS – 53%).

This minor RPDs difference is likely due to the low concentrations of analytes under review. This is not considered to have impacted the validity of the interpretation drawn upon this dataset.

Surface water

- Primary surface water Samples Analysed: 27
- Blind Duplicate Samples Analysed: 3

All RPDs were within acceptance criteria.

Sediment

QA/QC Aspects	Evidence & Evaluation
	▪ Primary Sediment Samples Analysed: 39 ▪ Blind Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria.
QC Testing – Interlab Duplicates (Secondary Lab)	***Groundwater*** ▪ Primary Groundwater Samples Analysed: 62 ▪ Interlab Duplicate Samples Analysed: 7 RPDs were within acceptance criteria with the following exceptions: ▪ QC201 (PFPeS – 31%) ▪ QC202 (PFOS – 80%) ▪ QC203 (PFHpS – 21%, PFOS – 34%, PFOA – 26%) ▪ QC204 (PFPeS – 39%, PFOS – 42%) These RPDs difference are likely due to the differences of methodologies between the primary and secondary laboratories and/or low concentrations of analytes under review. Concentrations were either higher for the primary sample (conservative value reported on) or of the same order of magnitude. This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Porewater*** ▪ Primary porewater Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria. ***Surface water*** ▪ Primary surface water Samples Analysed: 27 ▪ Interlab Duplicate Samples Analysed: 3 All RPDs were within acceptance criteria. ***Sediment*** ▪ Primary sediment Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria.
Field Blanks	Field Blanks were collected at a rate of one per fieldwork day. All field blank samples tested reported analytes below the laboratory limit of reporting.
Laboratory Internal QC	Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, matrix spikes, laboratory control samples and laboratory duplicates. All Method Blank, Laboratory Control and surrogate recovery results were within acceptable range. All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following: ▪ EP2307434, EP2307463, EP2307502, EP2307587, EP2307590, EP2307593: - Samples ID: Anonymous, SW319, PW346, MW228: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2307415, EP2307433, EP2307463: - Samples ID: Anonymous, MW496, QC103: PFHxS and PFOS matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level. ▪ EP2307435, EP2307495: - Sample ID: SD375, Anonymous: PFOS recovery data less than lower data quality objective. - Sample ID: SD375, Anonymous: EtFOSAA recovery data greater than upper data quality objective. The following quality control samples frequency outliers were reported:

QA/QC Aspects	Evidence & Evaluation
	▪ EP2307415, EP2307498, EP2307500: - Laboratory Duplicates: PFAS by LCMSMS, expected frequency 10% not achieved. ▪ EP2307433, EP2307493, EP2307497, EP2307555, EP2307586, EP2307587, EP2307588, EP2307590, EP2307592, EP2307593: - Laboratory Duplicates: PFAS by LCMSMS, expected frequency 10% not achieved. - Matrix Spikes: PFAS by LCMSMS, expected frequency 5% not achieved. ▪ EP2307434: - Matrix Spikes: PFAS by LCMSMS, expected frequency 5% not achieved. The above outliers/exceptions are not considered to affect the reliability of the dataset.
Laboratory Method Detection Limit	Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.
NATA endorsement of laboratory reports	Laboratory reports were stamped with the NATA endorsement stamp and signature. ALS Accreditation No. 825 Eurofins ARL Accreditation No. 1261
Calibration of Field Equipment	All equipment used during the investigation was calibrated by the supplier prior to use and daily readings of reference solutions (bump tests) were completed. The equipment calibration certificates, and daily field bump test records are provided in Appendix D.
Decontamination and Equipment Blanks	Rinsate blanks were collected at a rate of one per day per sampler when reusable equipment was used. All rinsate samples tested reported analytes concentrations below the laboratory LORs.
	Data Comparability
Standard Procedures	Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.
Qualified Personnel	Staff involved in managing and reviewing the project and those involved in fieldwork are experienced and qualified personnel.
Sample Integrity	Field Chain of Custody/Laboratory request forms can be found in Appendix C.
	Data Completeness
Completeness of test program	The scope of work undertaken was generally consistent with the SAQP.
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection process and therefore, the data set used as the basis for groundwater, surface water, porewater and sediment investigation is considered valid and complete.

PFAS OMP Quarterly Sampling Event Factual Report

September 2023

HMAS Stirling

304700525

Prepared for
Department of Defence

24 November 2023

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now

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Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

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Chemical Names

DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluorohexane Sulfonate
PFOA	Per-fluorooctanoic Acid
PFOS	Per-fluorooctane Sulfonate

Technical Terms

AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
AS	Australian Standard
BGL	Below Ground Level
CEC	Cation Exchange Capacity
COC	Chain of Custody
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
DWER	Department of Water and Environmental Regulation
EC	Electrical Conductivity
EPA	Environment Protection Authority
ERA	Ecological Risk Assessment
ESA	Environmental Site Assessment
HEPA	Heads of Environmental Protection Authority
LOR	Limit of Reporting
N/A	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEMP	National Environmental Management Plan
NEPM	National Environmental Protection Measure
ORP	Oxidation Reduction Potential
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
RWL	Reduced water levels
SAQP	Sampling and Analysis Quality Plan
SWL	Standing water level

Units

ha	Hectares
mAHD	Metres relative to the Australia Height Datum
mBGL	Metres Below Ground Level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
mV	Millivolt
µg/L	Microgram per Litre
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity – Water)

Site Specific

OMP	Ongoing Monitoring Plan
FTA	Fire Training Area
HSF	Helicopter Support Facility

1 Introduction

1.1 Background

Cardno was engaged by the Australian Department of Defence ("Defence") to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) at HMAS Stirling ("the site"). The site is located on Garden Island, Western Australia.

The OMP was carried out in accordance with the scope and limitations presented in Cardno's Sampling and Analysis Quality Plan (SAQP):

> Cardno, August 2023, Reference: DEF19009, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling.* Rev 11.

The SAQP was reviewed and updated prior to the Q3 2023 monitoring event, no major methodology or scope change was made.

For the purposes of this report:

> The Management Area was defined as comprising of Garden Island and the marine nearshore environment (Figure 1A, Appendix A).

1.2 Purpose & Objectives

The objective of the OMP is to assess the changes in the nature and extent of PFAS within the environment, specifically where there is an identified potentially elevated risk to a receptor or a potential future risk to a receptor associated with Defence's historical use of legacy Aqueous Film Forming Foam (AFFF).

The purpose of this PFAS OMP factual report is to provide an up-to-date status of the condition of the site as it is currently understood in relation to the most recent sampling event.

The objectives of the report are:

> To provide a succinct summary of the Q3 2023 sampling event and provision of analytical results with supporting tables and figures.

> To provide confirmation of the current understanding of risk.

> To provide supporting data for the assessment of management actions, where relevant.

1.3 Relevant Guidelines

This assessment has been undertaken in general accordance with applicable industry standards for a site investigation for the purpose, objectives and scope identified in this report. These standards are set out in:

> National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended 2013) (ASC NEPM).

> Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, *PFAS National Environmental Management Plan (NEMP) 2.0*.

> Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds*.

> Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling*.

> Australian and New Zealand Guidelines (ANZG), 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

> Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*[1].

[1] It is noted that the site is located on Commonwealth Land and is regulated under the Commonwealth environmental legislation, the State based DWER guidelines are relevant for the sampling of off-site properties and waterways.

> Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.

> U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*.

> U.S. EPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)*.

> National Health and Medical Research Council (NHMRC), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

2 Scope of Work

Cardno carried out the tasks detailed in the following sections in order to satisfy the purpose and objectives of this assessment. The PFAS source areas are shown on Figure 1B, Appendix A.

2.1 Groundwater Monitoring

Sampling of selected groundwater monitoring wells was performed in general accordance with the SAQP (Cardno, 2023), applying methods set out in Section 3 of this report. The groundwater wells monitored as part of the OMP are presented in Table 2-1, and are shown on Figures 2A and 2B, Appendix A.

Table 2-1 Groundwater Monitoring Locations

Monitoring Area	Location ID	No.
Demolition Ground	MW139, MW141, MW142, MW147, MW149	5
Fire Training Area	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128	11
Wastewater treatment plant	MW158, MW161, MW166, MW171, MW172, MW173, MW193, MW195D, MW195S, MW196, MW197, MW199, MW200, MW202, MW203	15
Accommodation Area	MW288, MW289	2
Dredged Sediments	MW268, MW269	2
AVCAT Storage and Fuel Farm	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW249, MW496, MW516	11
Fire Station, Flammable / Hazardous Goods and Waste Storage, Ship Sullage	MW255, MW256, MW257, MW258, MW259	5
Helicopter Support Facility	MW214, MW215, MW216, MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282	11

2.2 Porewater, Surface Water and Sediment Monitoring

Porewater, sediment and surface water sampling were performed in general accordance with the SAQP (Cardno, 2023), applying methods set out in Section 3 of this report. The porewater, surface water and sediment monitoring locations monitored as part of the OMP are presented in Table 2-2, and are shown on Figures 3A to 5B, Appendix A.

Table 2-2 Porewater, Surface Water and Sediment Monitoring Locations

Monitoring Area	Porewater Sampling Location ID	No.	Sediment Sampling Location ID	No.	Surface Water Sampling Location ID	No.
Demolition Ground	PW329, PW330, PW331, PW356, PW357, PW358	6	SD329, SD330, SD331, SD356, SD357, SD358	6	SW150, SW152, SW154, SW156	4
Fire Training Area	PW335, PW340, PW341, PW362, PW363, PW364	6	SD335, SD340, SD341, SD362, SD363, SD364	6	SW130, SW132, SW134	3
WWTP	PW304, PW345, PW367, PW368, PW369, PW350, PW351, PW352, PW380, PW381, PW401	11	SD304, SD345, SD367, SD368, SD369, SD350, SD351, SD352, SD380, SD381, SD401	11	SW305, SW370, SW371, SW372, SW373, SW353, SW382, SW383, SW384	9
Accommodation Area	PW346	1	SD346	1		
Dredged Sediments	PW374, PW375, PW378	3	SD374, SD375, SD378	3	SW317, SW318, SW319	3
Helicopter Support Facility	PW306, PW307, PW308, PW314, PW315, PW316, PW405, PW407, PW409, PW411, PW413, PW415	12	SD306, SD307, SD308, SD314, SD315, SD316, SD405, SD407, SD409, SD411, SD413, SD415	12	SW309, SW310, SW311, SW406, SW408, SW410, SW412, SW414, SW416	9

2.3 Data Management

All the data included in the report has been collected, uploaded, and reviewed according to the data management requirements of the *Defence Contamination Management Manual* (DCMM) Annex L (Defence, 2021), including:

- The sample naming convention detailed in the DCMM Annex L was used in the field;
- All field data collected was uploaded to the ESdat database;
- Laboratory data was uploaded and approved; and
- QA/QC data was reconciled.

2.4 Deviations from the OMP SAQP

Deviations from the SAQP for the Q3 2023 monitoring event are presented in Table 2-3 below.

Table 2-3 Deviations from OMP SAQP

Location	Deviation	Comments/Impact
MW195S, MW196	Not sampled	Wells were found dry - Limited impact, wells seasonally found dry, nearby wells were sampled.
MW197	Not sampled	Well casing silted up, unable to unblock with a steel bailer due to the size of PVC casing (too narrow). Limited impact, this well was found dry during most monitoring events, nearby wells were sampled.
MW199	Not sampled	Casing blocked (bent) below ground level, unable to unblock with a steel bailer. Moderate impact, several bores were not sampled (dry or blocked) in the area.
MW172	Not sampled	No access track, overgrown vegetation, high risk of snake encounter. Limited impact – bore was often found dry and is recommended for removal in the draft OMP review.
MW282	Not sampled	Insufficient water in HydraSleeve® to collect a sample. Limited impact, nearby wells monitoring the HSF were sampled.
MW214, MW215	No field parameters recorded	Insufficient water in HydraSleeve® to take field parameters readings. No impact on OMP.

Location	Deviation	Comments/Impact
MW233	No standing water level (SWL) recorded	No impact – Nearby wells' SWL were used to infer groundwater contours and flow direction.

3 Methodology

3.1 Groundwater Sampling Methodology

Groundwater monitoring was generally undertaken by no purge HydraSleeve® method as detailed in Table 3-1.

Table 3-1 Groundwater Sampling Methodology

Activity	Details
Well Gauging	SWL were gauged using a dip meter. All wells were measured against a surveyed mark at the top of the well casing. Time of gauging was recorded on field records sheets.
Groundwater Field Parameters	Groundwater field parameters were recorded via a pre-calibrated water quality meter prior to deployment of HydraSleeves® or pre-sample collection. The following field parameters were recorded: ▪ pH ▪ electrical conductivity (EC) ▪ oxidation reduction potential (ORP) ▪ Dissolved oxygen (DO) ▪ Temperature Once field parameters were stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurements were recorded on field data records. All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and bump tested daily to optimise the accuracy of the measurements taken. Calibration certificates and bump test records are provided in Appendix D.
Deployment of HydraSleeve®	HydraSleeve® were deployed with top weight for sample collection to begin at the lowest point. Following Q3 2023 sampling, new HydraSleeve® were deployed in preparation for the next OMP monitoring event scheduled for Q4 2023, using the same string for consistency (same depth of sampling i.e. within screen depth).
Retrieval of HydraSleeve® (Sample Collection)	HydraSleeve® sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. HydraSleeve® used during Q3 2023 were the ones deployed following Q2 2023. Samples were collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples were discharged immediately (minimise changes in chemistry) via discharge tube.
Hand bailing (alternative sampling method)	Disposable HDPE hand bailers, attached to a polypropylene string, were used at wells where the water column wasn't sufficient to fill the HydraSleeve®. Purging of the well was undertaken prior to sampling to ensure that a sample representative of the aquifer is taken (i.e. removal of 3x well volume).
Decontamination procedure	Dedicated HydraSleeve® and HDPE hand bailers (single use and disposable) were used at each groundwater well thus removing the need for decontamination. All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.

Activity	Details
Sample identification, preservation transport and holding times	Each sample bottle was pre-labelled by the laboratory with a unique barcode. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). Where holding times did not comply, this is discussed in the data quality review in Appendix E.
Quality Control	Groundwater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Groundwater samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance). The primary laboratory was ALS Global Laboratories (Perth), and the secondary laboratory (quality control) was Eurofins (Perth). Both laboratories are NATA-accredited for the parameters tested. Copies of the NATA stamped laboratory reports and CoC documentation are included in Appendix C.

3.2 Porewater and Sediment Sampling Methodology

The methodologies for sediment and porewater sampling are detailed in Table 3-2 and Table 3-3 respectively.

Table 3-2 Sediment Sampling Methodology

Item	Details
Sample Collection	Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.
Field Parameters	At each sampling location, the sediment sample was visually assessed, and observations (including physical description) were recorded on field data sheets.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Quality Control	Sediment QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples greater than 1 per 10 primary samples. ▪ Field triplicate (inter-laboratory) samples greater than 1 per 10 primary samples sent to a secondary laboratory.
Laboratory Testing	Sediment samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes).

Table 3-3 Porewater Sampling Methodology

Item	Detail
Porewater Sample Collection	Porewater sampling was undertaken in accordance with the U.S. EPA guidance *Operating Procedure Pore Water Sampling*. Porewater was purged and sampled at less than 1 L per minute using a peristaltic pump, connected to a stainless steel tube with a screened section at its base (Drive-Point Piezometer). The porewater sampler was inserted to at least 1 m below the surficial marine sediments, to ensure collection of pore water rather than surface water. Tubing was replaced at each sampling location to prevent cross-contamination.
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter:

Item	Detail
	▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Porewater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Porewater samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.3 Surface Water Sampling Methodology

The methodology for the surface water monitoring is detailed in Table 3-4.

Table 3-4 Surface water Sampling Methodology

Item	Details
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature Field observations such as odours or sheen presence were also recorded on field sampling sheets.
Sampling Method	Surface water samples were collected directly into sample containers using a 'Grab' (manual) sample method via a long-handled sampling device. The sample container was positioned 10 cm below the surface water level where possible and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films. Samples were collected in accordance with Australian/New Zealand Standards (AS/NZS 5667.1:1998) *Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Surface water QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Surface water samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.4 Quality Control / Quality Assurance

A critical aspect of site assessments is the demonstration of the quality of the data used as the basis for the assessment. This is achieved through a Data Validation process which includes a review of the following data quality indicators, as described in the SAQP:

- QA documentation.
- Bias.
- Data Representativeness.
- Data Precision & Accuracy.
- Laboratory Performance.
- Data Comparability.
- Data Set Completeness.

A detailed review of these aspects has been undertaken, the results of which are presented in Appendix E. The QA/QC review concluded that there are no significant systematic errors in the data collection process and therefore, the dataset used for the assessment is considered valid and complete.

3.5 Assessment Criteria

3.5.1 Groundwater, Porewater and Surface Water

The adopted assessment criteria for groundwater, porewater and surface water are detailed in Table 3-5.

Table 3-5 Criteria for Groundwater, Porewater and Surface Water

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	µg/L		
Human Health - Drinking Water Quality Guideline	0.07[1]	0.56	HEPA 2020
Human Health – Recreational Water	2[1]	10	HEPA 2020
Ecological – 99% species protection	0.00023[2]	19	HEPA 2020

Notes:

1. Sum of PFOS and PFHxS.
2. PFOS only. The criterion of 0.00023 µg/L is lower than the laboratory level of reporting (LOR), however, the PFAS NEMP 2020 allows for the adoption of the laboratory LOR as a screening level rather than a quantified measurement.

3.5.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. Sediment analytical results will be compared to the historical results range for each location.

4 Field Observations and Results

4.1 General Site Observations

0.4mm to 1.6mm of rainfall was recorded at the BoM station 9256 (HSF, Garden Island) during the Q3 2023 monitoring event. This limited rainfall amount wouldn't have impacted groundwater contours and local flow direction.

The daily maximum temperature during the monitoring event varied between 18 and 20°C.

4.2 Groundwater

4.2.1 Summary of Field Observations

4.2.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the groundwater sampling event are presented in field sampling records, included in Appendix D.

Field parameters were generally consistent with previous monitoring events. Groundwater pH ranged from 6.73 (MW141) to 8.10 (MW257) and was near neutral, water was observed clear to cloudy/green in colour. Groundwater temperature ranged from 16.8°C (MW233) to 21.8°C (MW289). DO readings ranged from 0.28 mg/L (MW127) to 9.55 mg/L (MW22457) which indicates aerobic groundwater conditions. EC readings ranged from 177 µS/cm (MW225) to 41,286 µS/cm (MW226) and indicate fresh to highly saline groundwater conditions. There was a sulphur odour noted at MW127.

4.2.1.2 Groundwater Elevation and Migration

Groundwater gauging data and reduced water levels (RWL) are provided within the field records in Appendix D. The groundwater elevations ranged between 0.01 mAHD (MW217) and 0.65 mAHD (MW166) which is similar to previous monitoring event. It is expected that groundwater levels and flow direction for monitoring well relatively close to the shoreline are locally and temporally influenced by tidal pressures.

Gauging data was used to infer the groundwater migration contours. Groundwater flow was interpreted to be radial from the site and towards areas of depression following local topography (i.e. groundwater generally flows towards the nearest coastline), which is consistent with previous monitoring events. Groundwater inferred elevation contours and inferred flow direction for the Q3 2023 monitoring event are shown in Figure 6, Appendix A.

4.2.2 Groundwater Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-1. Laboratory results have also been compared to available historical data to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figures 2A and 2B in Appendix A presents the groundwater monitoring locations. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	MW112, MW141, MW236, MW500	0.56[2]	1.58 (MW112)	56	4
Sum of PFOS and PFHxS	MW109, MW112, MW120, MW121, MW123, MW125, MW128, MW141, MW142 MW161, MW166, MW171, MW173, MW193, MW215, MW216, MW220, MW228, MW236, MW240, MW249, MW255, MW256, MW257, MW258, MW259, MW268, MW269, MW288, MW289, MW496, MW500, MW516	0.07[2]	67.7 (MW236)	56	33

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOS	MW109, MW112, MW120, MW121, MW123, MW125, MW128, MW141, MW142, MW161, MW166, MW171, MW173, MW193, MW202, MW216, MW217, MW220, MW224, MW233, MW236, MW240, MW242, MW245, MW249, MW255, MW256, MW257, MW258, MW259, MW269, MW288, MW289, MW496, MW500, MW516	0.01[3]	53.6 (MW236)	56	36

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water.
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the groundwater monitoring locations in Q3 2023.

4.3 Surface Water

4.3.1 Summary of Field Observations

4.3.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the surface water sampling program are presented in field sampling records, included in Appendix D. Parameters were generally consistent with the previous monitoring events. Surface water pH ranged from 7.65 (SW154) to 8.21 (SW412) and was near neutral, temperature was 20.0°C on average, water was generally clear and EC readings ranging 26,832 (SW409) to 54,270 µS/cm (SW150) indicate highly saline conditions. DO readings ranging 3.02 (SW150) to 6.95 mg/L (SW305) indicate aerobic surface water conditions. No visual or olfactory evidence of contamination were recorded.

4.3.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-2. Laboratory results have also been compared to available historical data to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figures 3A and 3B in Appendix A presents the surface water monitoring locations. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-2 Summary of Surface water Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	28	0
Sum of PFOS and PFHxS	SW372, SW373	0.07[2]	0.21 (SW373)	28	2
PFOS	SW150, SW372, SW373	0.01[3]	0.20 (SW373)	28	3

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the surface water monitoring locations in Q3 2023.

4.4 Porewater

4.4.1 Summary of Field Observations

4.4.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the porewater sampling program are presented in field sampling records, included in Appendix D. Parameters were generally consistent with the previous monitoring events. Porewater pH ranging 7.36 (PW331) to 8.24 (PW307) was near neutral, with an average temperature of 18.3°C. Water was generally clear and EC readings ranging 28,015 (PW363) to 55,199 µS/cm (PW357) indicate saline to highly saline porewater conditions. DO readings ranging 0.61 (PW335) to 6.83 mg/L (PW351) indicate aerobic porewater condition.

4.4.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-3. Laboratory results have also been compared to available historical data to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figures 4A and 4B in Appendix A presents the porewater monitoring locations. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-3 Summary of Porewater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	39	0
Sum of PFOS and PFHxS	PW346	0.07[2]	0.26 (PW346)	39	1
PFOS	PW304, PW331, PW345, PW346, PW367, PW368, PW369, PW374	0.01[3]	0.24 (PW346)	39	8

Notes:

1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water.
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations in Q3 2023.

4.5 Sediment

4.5.1 Summary of Field Observations

Observations recorded during the sediment sampling program are provided in the field sampling records within Appendix D. Sediment samples were generally described as beige, fine to medium grained, wet sand.

4.5.2 Laboratory Results

The results of laboratory analysis have been compared to available historical data. Figures 5A and 5B in Appendix A presents the sediment monitoring locations. Tabulated results are presented in Appendix B and the laboratory reports are provided in Appendix C.

Findings are summarised as follows:

> No first-time detection of PFOS or Sum of PFOS and PFHxS was reported for the sediment monitoring locations in Q3 2023.

4.6 Changes to the Monitoring Network Condition

The following changes to the OMP monitoring network were noted during Q3 2023:

- Monitoring well MW197 PVC casing was found with the screen silted up (filled with fine sediment) and unable to be unblocked due to the casing diameter being too narrow.
- Monitoring well MW199 was found blocked with a suspected bent casing below ground level.
- The access to MW172 was lost in dense vegetation and deemed unsafe to access.
- Monitoring well MW258 was cleared with a steel bailer to prevent root blockage for the next monitoring event.

5 Summary and Conclusions

Cardno undertook the Q3 2023 groundwater, porewater, surface water and sediment monitoring event at HMAS Stirling as part of the PFAS OMP. Sampling and testing was undertaken at 56 monitoring wells, 28 surface water locations and 39 co-located sediment and porewater sampling locations.

Groundwater levels were gauged in all wells before sampling, except for MW233. Groundwater flow was interpreted to be radial from the site where mounding of groundwater is occurring (i.e. groundwater follows the site's topography and flows towards the ocean), consistent with the previous monitoring events.

The groundwater laboratory results reported the following:

- Of the 56 samples that were tested, PFOA (4 samples), PFOS (36 samples) and Sum of PFHxS and PFOS (33 samples) reported concentrations that exceeded adopted assessment criteria.
- No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the groundwater monitoring locations in Q3 2023.

The surface water laboratory results reported the following:

- Of the 28 samples tested, PFOS (3 samples) and Sum of PFHxS and PFOS (2 samples) were reported above the adopted assessment criteria.
- No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the surface water monitoring locations in Q3 2023.

The porewater laboratory results reported the following:

- Of the 39 samples that were tested, PFOS (8 samples) and Sum of PFOS and PFHxS (1 sample) reported concentrations above adopted assessment criteria.
- No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations in Q3 2023.

The sediment laboratory results reported the following:

- No first-time detection was reported for the sediment monitoring locations in Q3 2023.

The following actions should be undertaken prior to the next OMP sampling event:

- Replacement of the groundwater monitoring wells lost/damaged at the demolition ground (MW137, MW272) and main base area (MW517, MW264, MW518, MW010, MW261).

The next OMP sampling event for HMAS Stirling will be the quarterly monitoring event (Q4 2023), scheduled for December 2023. An Ongoing Monitoring Interpretive Report will be prepared for the October 2022 – September 2023 monitoring period.

6 References

General References

1. Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 – Non-volatile and semi-volatile compounds*.
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7. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (https://maps.water.wa.gov.au/#/webmap/gwm).
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10. National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended), registered May 2013.
11. National Health and Medical Research Council (NHMRC) (2011 – updated 2022) *National Water Quality Management Strategy Australian Drinking Water Guidelines 6*, September 2022.
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15. USEPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8).*

Site Specific References

16. Department of Defence, January 2019, *HMAS Stirling Garden Island PFAS Management Area Plan*, Final.
17. Cardno, 11 August 2022, Reference: DEF19009, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling*. Rev 7.
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20. Cardno, 23 September 2020, *PFAS OMP 2020 Q2 Quarterly Sampling Event Factual Report*, HMAS Stirling.
21. Cardno, 22 January 2021, *PFAS OMP 2020 Q3 Quarterly Sampling Event Factual Report*, HMAS Stirling.
22. Cardno, March 2021, *PFAS OMP 2020 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling.
23. Cardno, June 2021, *PFAS OMP 2021 Q1 Quarterly Sampling Event Factual Report*, HMAS Stirling.
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27. Cardno, April 2022, *PFAS OMP 2021 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling.

28. Cardno, now Stantec, October 2022, *draft PFAS OMP 2021 Annual Interpretive Report.*

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31. Cardno, now Stantec, December 2022, *PFAS OMP 2022 Q3 Quarterly Sampling Event Factual Report*, HMAS Stirling.

32. Cardno, now Stantec, February 2023, *PFAS OMP 2022 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling.

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APPENDIX

A

FIGURES

Cardno

now

Stantec

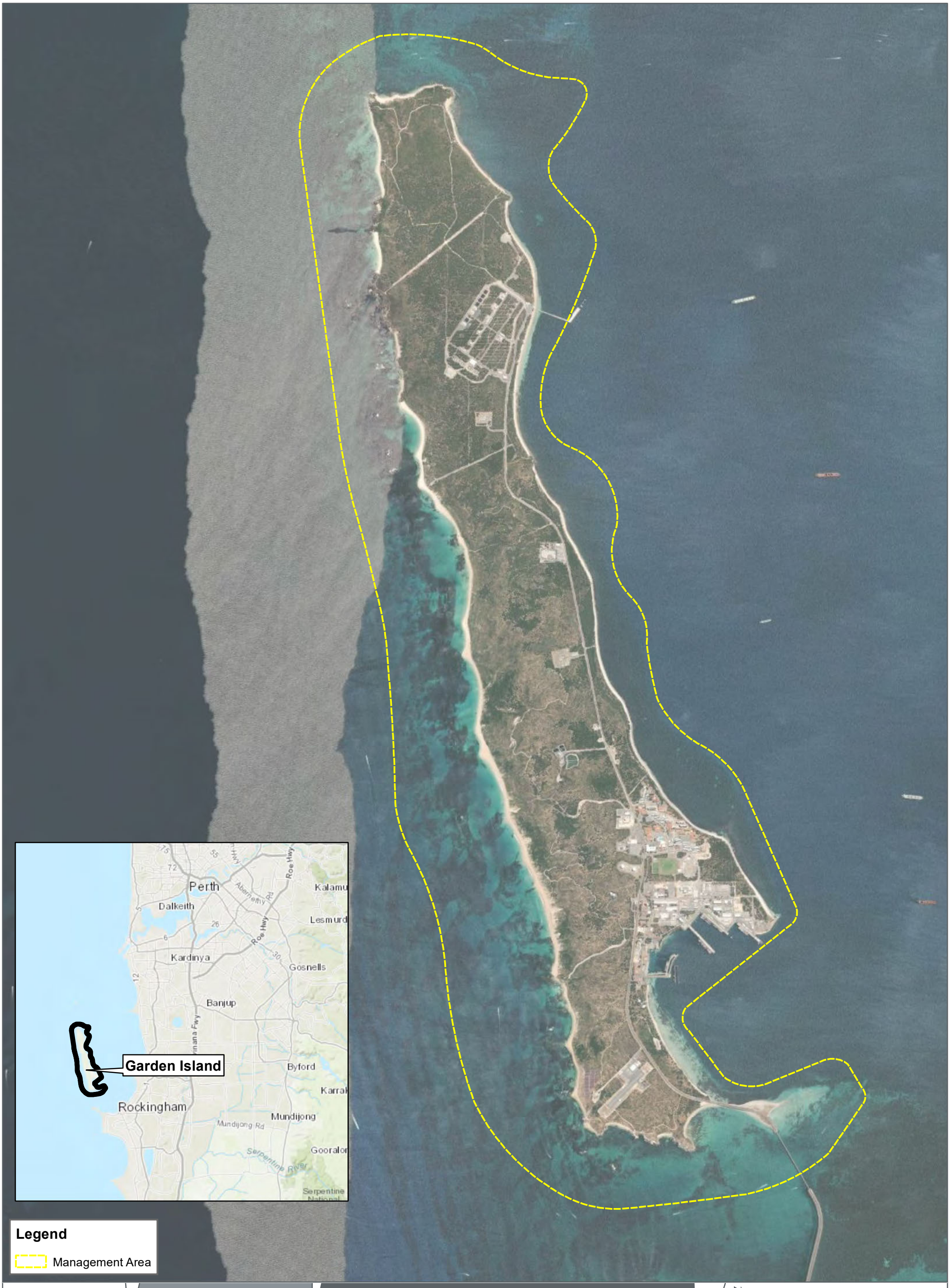


FIGURE 1A

1:32,000 Scale at A3

Metres

0 500 1,000

Site Location

Q3 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-09-27 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001A_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Map

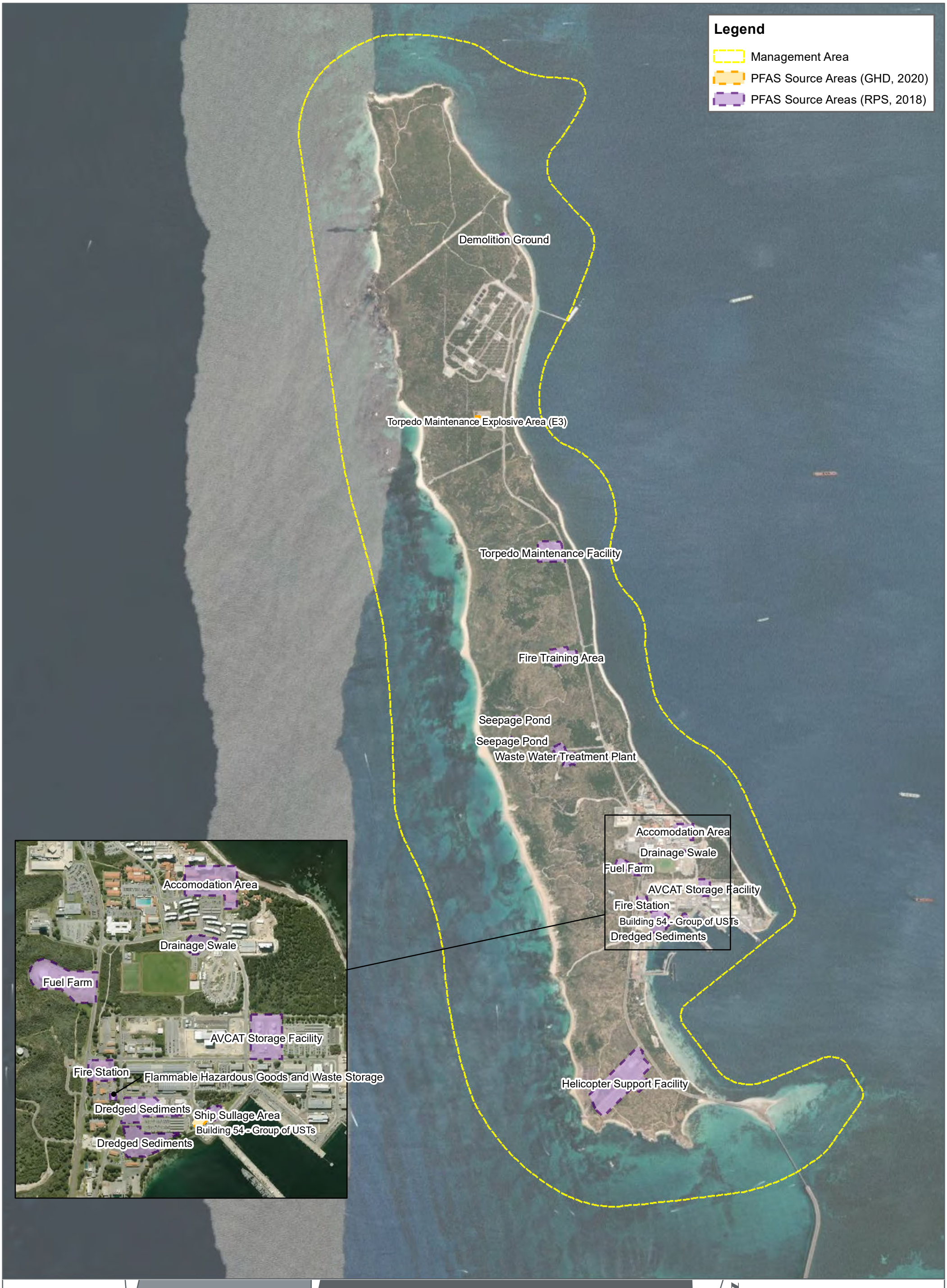


FIGURE 1B

1:32,000 Scale at A3

Metres

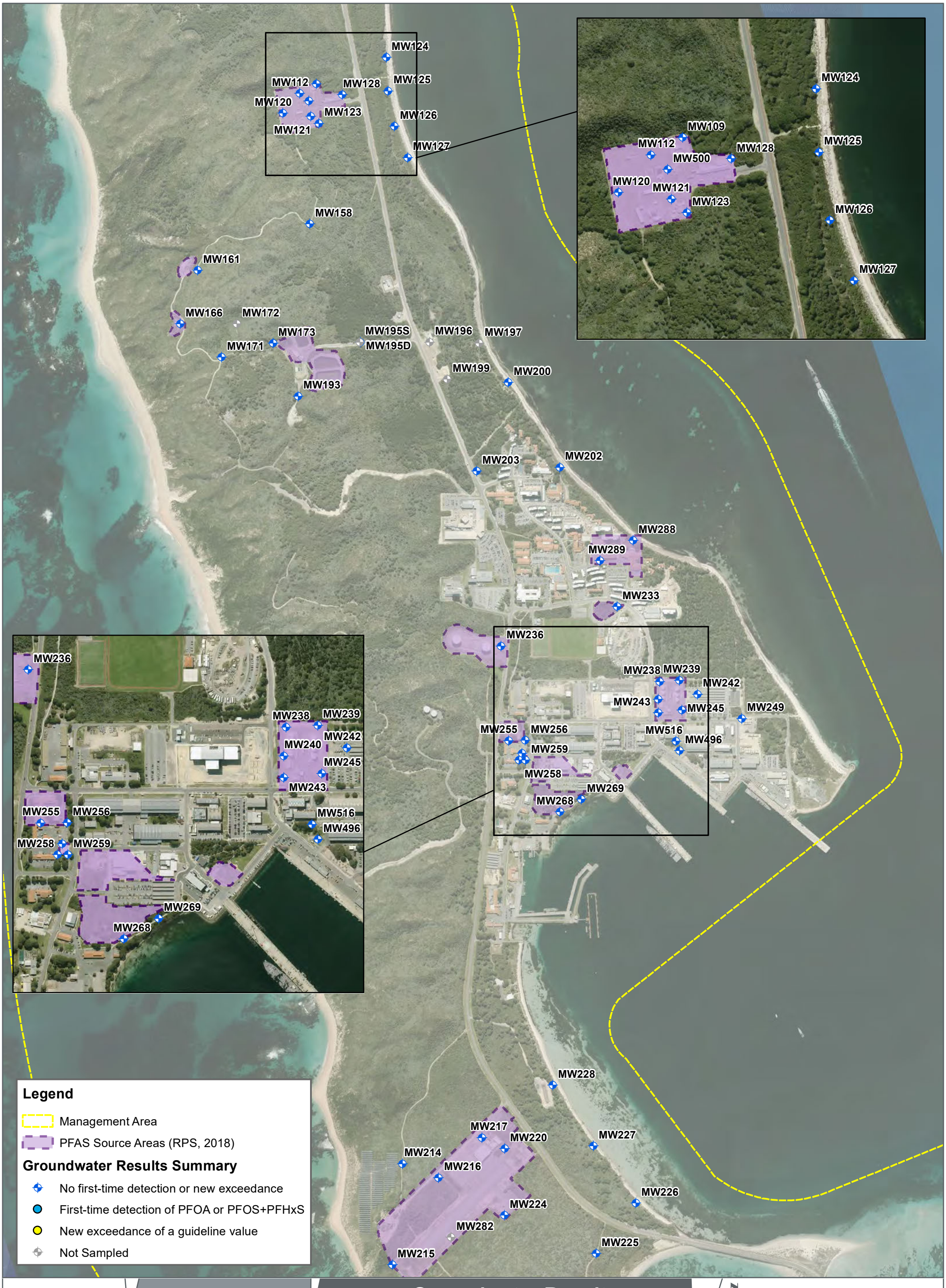
0 500 1,000

Management Area

Q3 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-09-27 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001B_ManagementArea 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap


MW124
MW112
MW128
MW125
MW120
MW123
MW126
MW121
MW127
MW158
MW161
MW166
MW172
MW173
MW195S
MW196
MW197
MW171
MW195D
MW199
MW200
MW193
MW203
MW202
MW288
MW289
MW233
MW236
MW238
MW239
MW242
MW243
MW245
MW249
MW255
MW256
MW516
MW496
MW259
MW258
MW269
MW268
MW228
MW217
MW220
MW227
MW214
MW216
MW226
MW224
MW282
MW225
MW215
MW109
MW500
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Groundwater Results Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
Not Sampled
FIGURE 2A
1:12,500 Scale at A3
Metres
0
300
600
Groundwater Results
Q3 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-09-28 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002A_2023Q3_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex

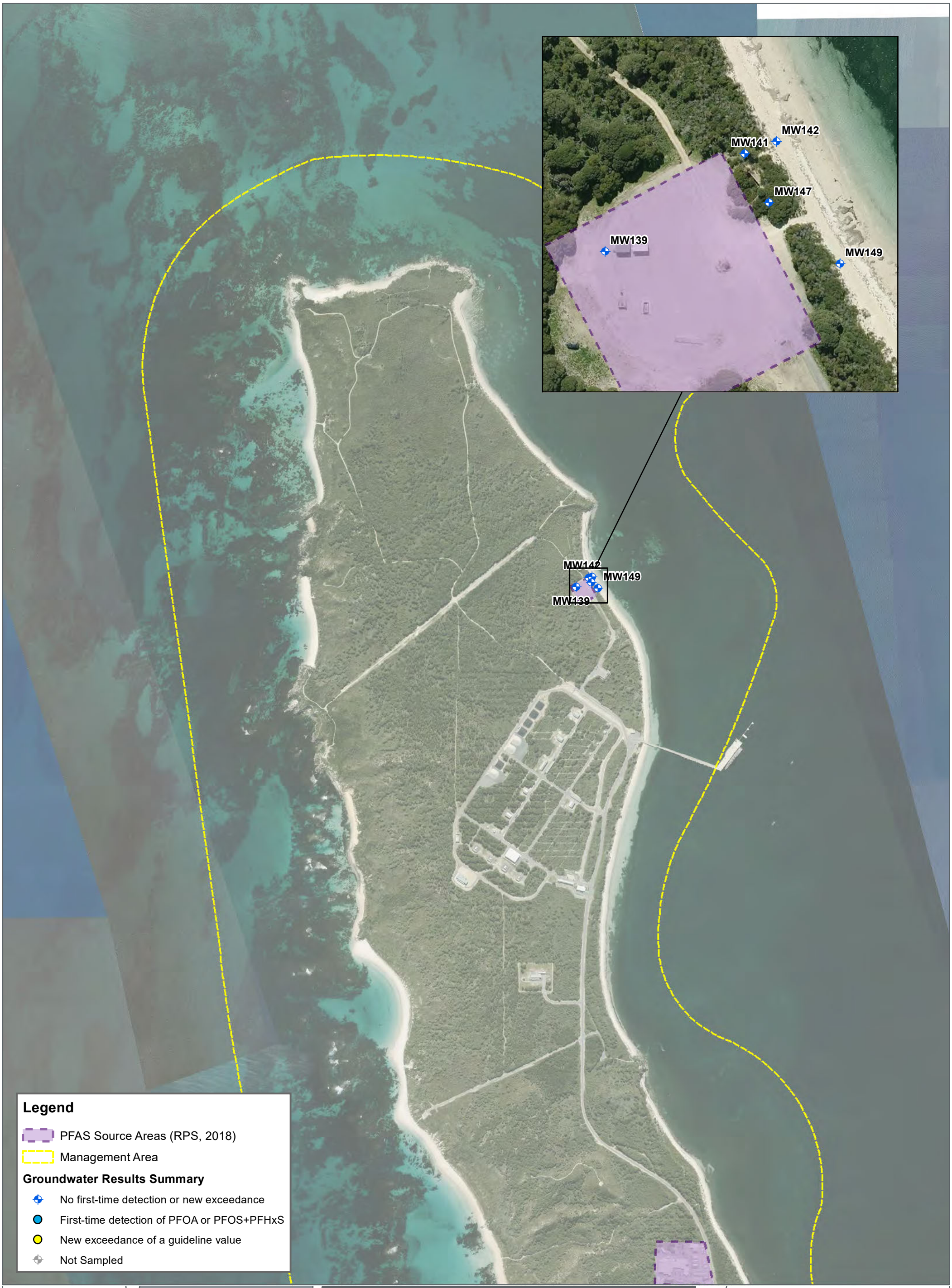


FIGURE 2B

1:15,000 Scale at A3

Metres

0 250 500

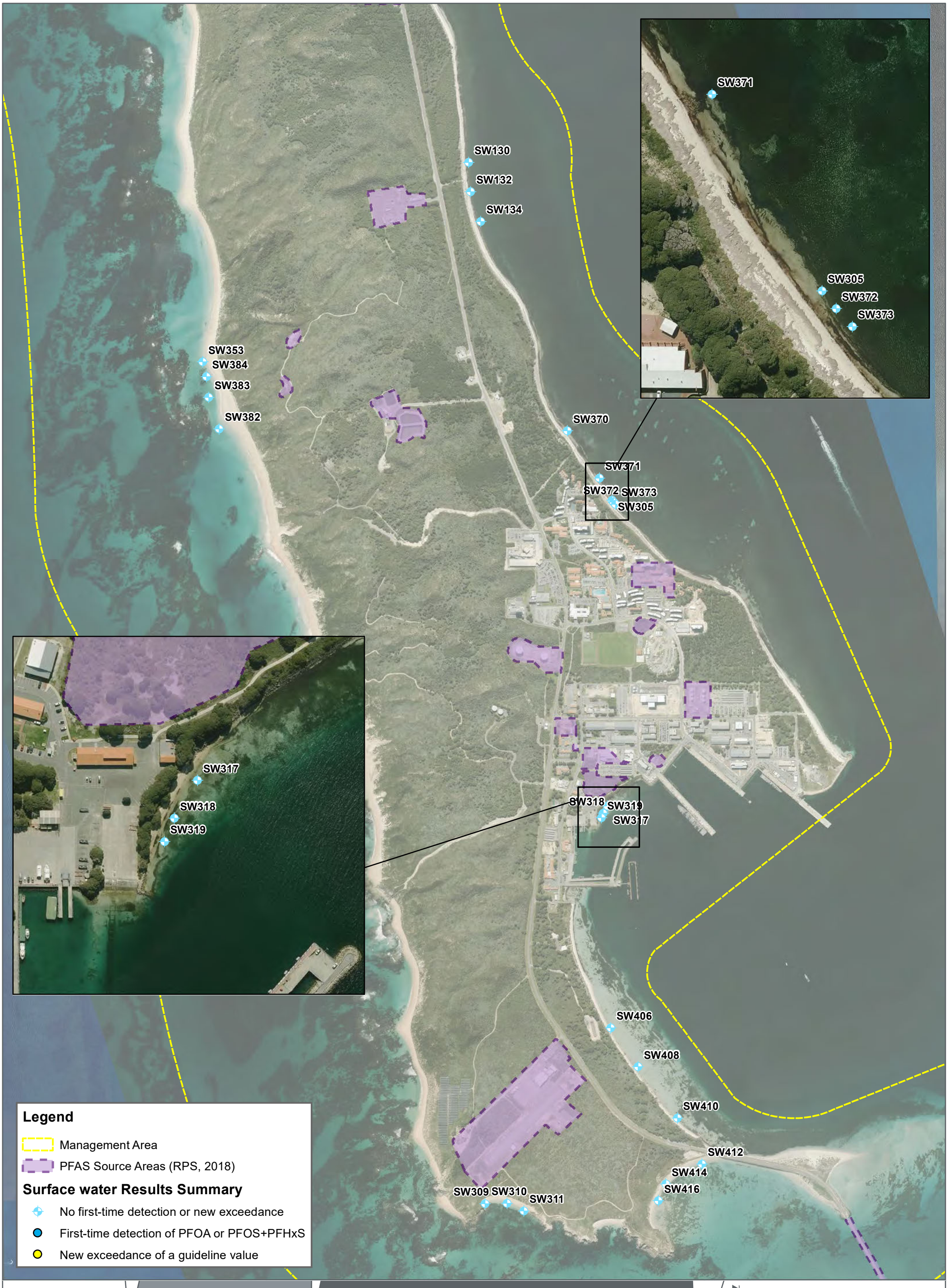
Groundwater Results

Q3 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-09-28 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002B_2023Q3_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex


SW371
SW130
SW132
SW134
SW305
SW372
SW373
SW353
SW384
SW383
SW382
SW370
SW371
SW372
SW373
SW305
SW317
SW318
SW319
SW318
SW319
SW317
SW406
SW408
SW410
SW412
SW414
SW416
SW309
SW310
SW311
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Surface water Results Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
FIGURE 3A
1:15,000 Scale at A3
Metres
0
300
600
Surface water Results
Q3 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-09-28 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003A_2023Q3_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex

SW150
SW152
SW154
SW156
SW154
SW156
SW152
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Surface water Results Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
FIGURE 3B
1:15,000 Scale at A3
Metres
0
300
600
Surface water Results
Q3 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-09-28 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003B_2023Q3_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

FIGURE 4A

1:15,000 Scale at A3

Metres

0 300 600

Porewater Results

Q3 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-09-28 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004A_2023Q3_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth

FIGURE 4B

1:15,000 Scale at A3

Metres

0 300 600

Porewater Results

Q3 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-09-28 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004B_2023Q3_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

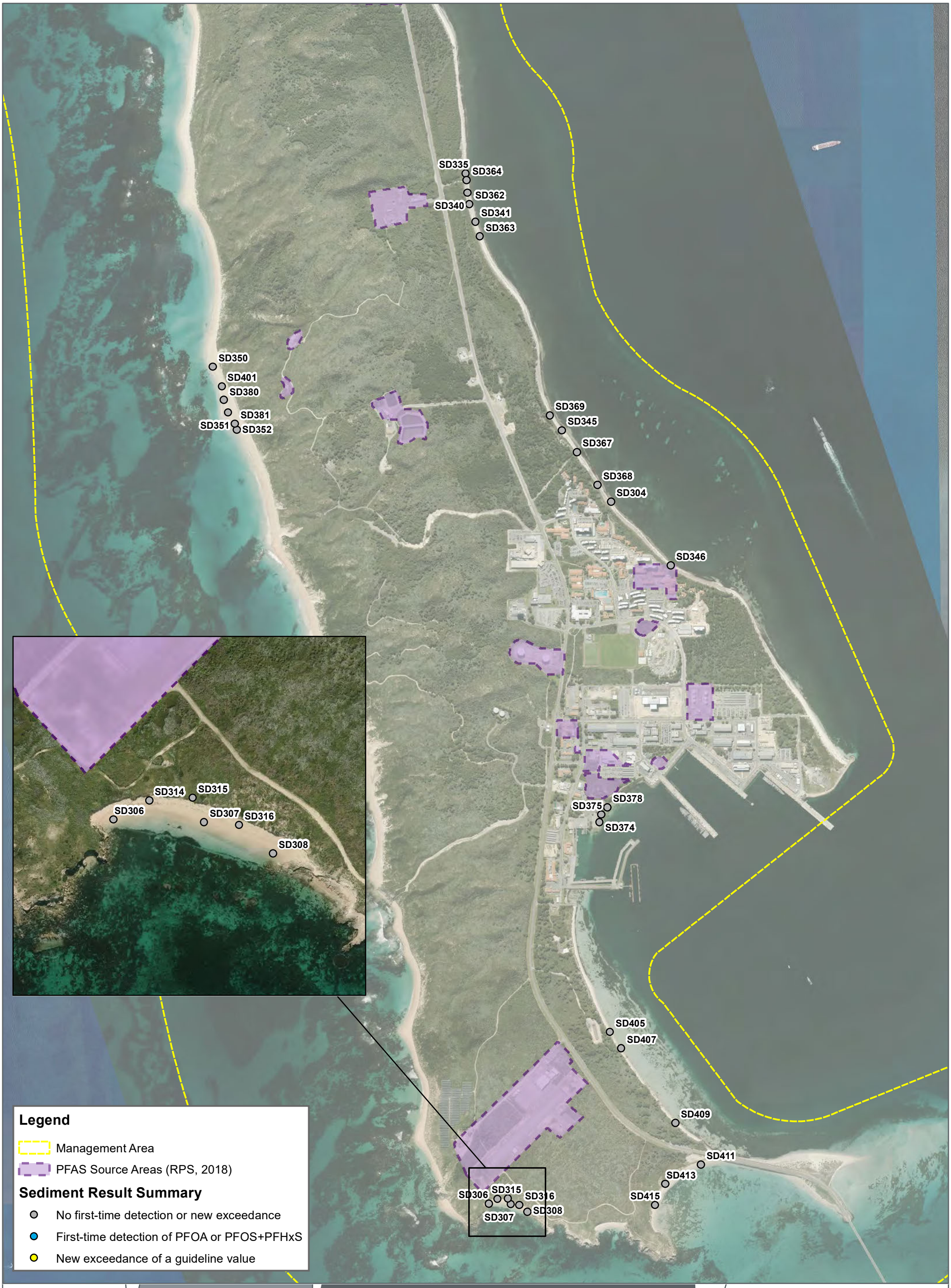

SD335
SD364
SD362
SD340
SD341
SD363
SD350
SD401
SD380
SD381
SD351
SD352
SD369
SD345
SD367
SD368
SD304
SD346
SD314
SD315
SD306
SD307
SD316
SD308
SD375
SD378
SD374
SD405
SD407
SD409
SD411
SD413
SD415
SD306
SD315
SD316
SD308
SD307
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sediment Result Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
FIGURE 5A
1:15,000 Scale at A3
Metres
0
300
600
Sediment Results
Q3 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-09-28 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005A_2023Q3_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth

FIGURE 5B

1:15,000 Scale at A3

Metres

0 300 600

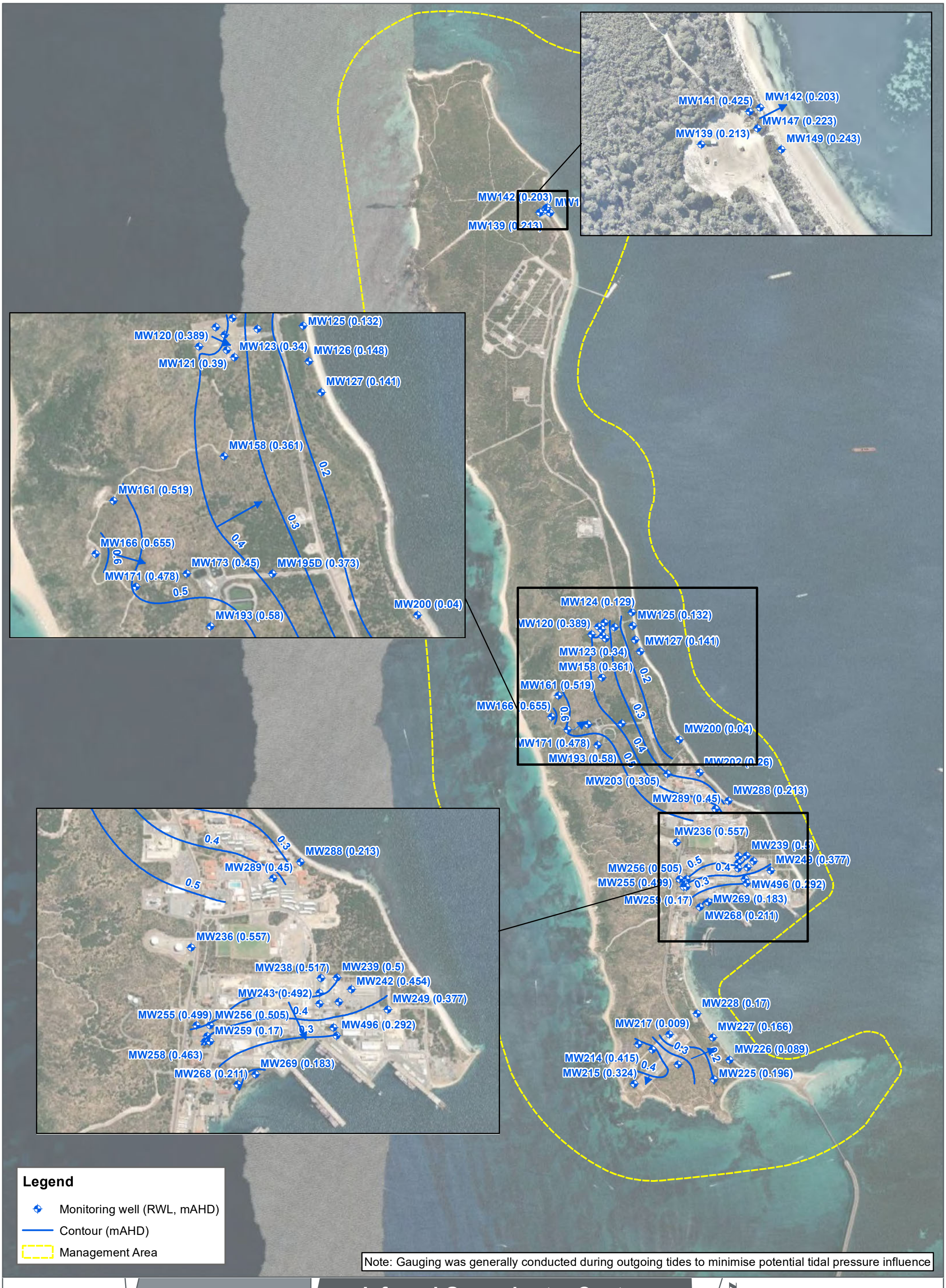
Sediment Results

Q3 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-09-28 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005B_2023Q3_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap


MW141 (0.425)
MW142 (0.203)
MW147 (0.223)
MW139 (0.213)
MW149 (0.243)
MW142 (0.203)
MW139 (0.213)
MW120 (0.389)
MW125 (0.132)
MW123 (0.34)
MW126 (0.148)
MW121 (0.39)
MW127 (0.141)
MW158 (0.361)
MW161 (0.519)
MW166 (0.655)
MW171 (0.478)
MW173 (0.45)
MW195D (0.373)
MW193 (0.58)
MW200 (0.04)
0.2
0.3
0.4
0.5
0.6
MW124 (0.129)
MW203 (0.305)
MW202 (0.26)
MW288 (0.213)
MW289 (0.45)
MW236 (0.557)
MW239 (0.5)
MW249 (0.377)
MW256 (0.505)
MW255 (0.499)
MW496 (0.292)
MW259 (0.17)
MW269 (0.183)
MW268 (0.211)
MW238 (0.517)
MW242 (0.454)
MW243 (0.492)
MW258 (0.463)
MW228 (0.17)
MW217 (0.009)
MW227 (0.166)
MW226 (0.089)
MW214 (0.415)
MW215 (0.324)
MW225 (0.196)
Legend
Monitoring well (RWL, mAHD)
Contour (mAHD)
Management Area
Note: Gauging was generally conducted during outgoing tides to minimise potential tidal pressure influence
FIGURE 6
1:32,000 Scale at A3
Metres
0
500
1,000
Inferred Groundwater Contours
Q3 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-10-04 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2023Q3_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

APPENDIX

B

DATA ASSESSMENT TABLES

Cardno

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Stantec

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids			
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01
PFAS NEMP 2020 Drinking Water																*0.56*										
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19										
PFAS NEMP 2020 Recreational Water																**10**										
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																					
		4/09/2023	0089_QC301_230904	Rinsate	EP2312228	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
		4/09/2023	0089_QC302_230904	Rinsate	EP2312228	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
		4/09/2023	0089_QC401_230904	Field Blank	EP2312228	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
		4/09/2023	0089_QC402_230904	Field Blank	EP2312228	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
		5/09/2023	0089_QC303_230905	Rinsate	EP2312177	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
		5/09/2023	0089_QC304_230905	Rinsate	EP2312177	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
		5/09/2023	0089_QC305_230905	Rinsate	EP2312177	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
		5/09/2023	0089_QC306_230905	Rinsate	EP2312177	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
		5/09/2023	0089_QC403_230905	Field Blank	EP2312177	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
		5/09/2023	0089_QC404_230905	Field Blank	EP2312177	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
		5/09/2023	0089_QC405_230905	Field Blank	EP2312177	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
		5/09/2023	0089_QC406_230905	Field Blank	EP2312177	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
		11/09/2023	0089_QC307_230911	Rinsate	EP2312528	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
		11/09/2023	0089_QC407_230911	Field Blank	EP2312528	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	MW109	5/09/2023	0089_MW109_230905	Normal	EP2312170	0.06	0.14	2.04	0.07	0.53	<0.02	<0.1	0.03	0.26	0.03	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	MW112	5/09/2023	0089_MW112_230905	Normal	EP2312170	0.08	0.27	11.0	1.44	30.4	<0.02	<0.1	0.13	0.70	0.35	*1.58*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.12	<0.05	<0.05
FTA	MW112	5/09/2023	0089_QC116_230905	Field Duplicate	EP2312170	0.08	0.27	10.2	1.37	28.0	<0.02	<0.1	0.12	0.63	0.32	*1.37*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.11	<0.05	<0.05
FTA	MW112	5/09/2023	0089_QC216_230905	Interlab Duplicate	1023399	0.06	0.27	11	0.90	32	<0.1	0.07	0.14	0.52	0.29	*1.4*	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.11	<0.01	<0.01
FTA	MW120	5/09/2023	0089_MW120_230905	Normal	EP2312170	0.02	0.04	1.60	0.28	1.26	<0.02	<0.1	<0.02	0.08	<0.02	0.12	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	MW120	5/09/2023	0089_QC115_230905	Field Duplicate	EP2312170	<0.02	0.04	1.62	0.26	1.21	<0.02	<0.1	<0.02	0.08	<0.02	0.11	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	MW120	5/09/2023	0089_QC215_230905	Interlab Duplicate	1023399	0.02	0.03	1.7	0.22	1.3	<0.01	<0.05	0.01	0.05	<0.01	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
FTA	MW121	5/09/2023	0089_MW121_230905	Normal	EP2312170	<0.02	<0.02	0.61	0.05	0.35	<0.02	<0.1	0.02	0.08	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	MW123	5/09/2023	0089_MW123_230905	Normal	EP2312170	0.09	0.06	0.47	<0.02	0.01	<0.02	<0.1	<0.02	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	MW123	5/09/2023	0089_QC114_230905	Field Duplicate	EP2312170	0.08	0.06	0.47	<0.02	0.01	<0.02	<0.1	<0.02	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	MW123	5/09/2023	0089_QC214_230905	Interlab Duplicate	1023399	0.09	0.05	0.57	<0.01	0.01	<0.01	<0.05	0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
FTA	MW124	5/09/2023	0089_MW124_230905	Normal	EP2312183	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	MW125	5/09/2023	0089_MW125_230905	Normal	EP2312183	0.10	0.10	0.38	<0.02	0.02	<0.02	<0.1	<0.02	0.12	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	MW126	5/09/2023	0089_MW126_230905	Normal	EP2312183	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	MW127	5/09/2023	0089_MW127_230905	Normal	EP2312183	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	MW128	5/09/2023	0089_MW128_230905	Normal	EP2312170	0.03	<0.02	0.09	<0.02	1.45	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	MW139	11/09/2023	0089_MW139_230911	Normal	EP2312528	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	MW141	11/09/2023	0089_MW141_230911	Normal	EP2312528	0.21	0.49	7.10	0.89	33.2	<0.02	0.1	0.28	3.05	0.14	*0.65*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	MW142	11/09/2023	0089_MW142_230911	Normal	EP2312528	0.17	0.32	4.19	0.14	3.27	<0.02	<0.1	0.28	3.07	0.08	0.33	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	MW147	11/09/2023	0089_MW147_230911	Normal	EP2312528	<0.02	<0.02	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	MW149	11/09/2023	0089_MW149_230911	Normal	EP2312528	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	MW158	4/09/2023	0089_MW158_230904	Normal	EP2312225	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	MW161	4/09/2023	0089_MW161_230904	Normal	EP2312225	<0.02	0.02	0.26	0.03	2.63	<0.02	<0.1	0.06	0.09	0.04	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	MW161	4/09/2023	0089_QC104_230904	Field Duplicate	EP2312225	<0.02	<0.02	0.25	0.03	2.71	<0.02	<0.1	0.06	0.10	0.04	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	MW161	4/09/2023	0089_QC204_230904	Interlab Duplicate	1023399	0.01	0.02	0.26	0.03	2.5	<0.01	<0.05	0.07	0.08	0.04	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
WWTP	MW166	4/09/2023	0089_MW166_230904	Normal	EP2312225	0.06	0.03	0.63	0.14	3.91	<0.02	<0.1	0.24	0.25	0.14	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	MW171	4/09/2023	0089_MW171_230904	Normal	EP2312225	1.00	0.59	4.93	0.87	0.87	<0.02	0.5	0.43	1.55	0.13	0.25	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	MW173	4/09/2023	0089_MW173_230904	Normal	EP2312225	0.12	0.08	1.67	0.33	2.60	<0.02	<0.1	0.06	0.23	0.04	0.15	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	MW193	4/09/2023	0089_MW193_230904	Normal	EP2312225	0.16	0.26	2.25	0.16	1.34	<0.02	<0.1	0.06	0.40	0.05	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	MW195D	4/09/2023	0089_MW195D_230904	Normal	EP2312225	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	MW195D	4/09/2023	0089_QC105_230904	Field Duplicate	EP2312225	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	MW195D	4/09/2023	0089_QC205_230904	Interlab Duplicate	1023399	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
WWTP	MW200	5/09/2023	0089_MW200_230905	Normal	EP2312170	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	MW202	5/09/2023	0089_MW202_230905	Normal	EP2312177	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	MW203	5/09/2023	0089_MW203_230905	Normal	EP2312183	0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW214	4/09/2023	0089_MW214_230904	Normal	EP2312225	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW215	4/09/2023	0089_MW215_230904	Normal	EP2312228	0.02	0.05	0.49	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW216	4/09/2023	0089_MW216_230904	Normal	EP2312225	0.13	0.14	1.53	0.06	0.33	<0.02	2.9	8.08	7.26	0.78	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.23	<0.05	<0.05
HSF	MW217	4/09/2023	0089_MW217_230904	Normal	EP2312225	<0.02	<0.02	0.01	<0.02	0.03	<0.02	1.1	5.14	4.86	0.72	0.33	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	18.8	0.30	<0.05
HSF	MW220	4/09/2023	0089_MW220_230904	Normal	EP2312225	0.03	0.02	0.32	0.06	4.86	<0.02	<0.1	0.08	0.12	0.04	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW224	4/09/2023	0089_MW224_230904	Normal	EP2312225	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW225	5/09/2023	0089_MW225_230904	Normal	EP2312187	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW226	4/09/2023	0089_MW226_230904	Normal	EP2312225	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW227	5/09/2023	0089_MW227_230905	Normal	EP2312187	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW228	5/09/2023	0089_MW228_230905	Normal	EP2312187	0.25	0.17	0.36	<0.02	<0.01	<0.02	1.0	3.16	3.70	0.97	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.45	<0.05	<0.05
HSF	MW233	4/09/2023	0089_MW233_230904	Normal	EP2312225	<0.02	<0.02	0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW236	5/09/2023	0089_MW236_230905	Normal	EP2312187	0.19	0.37	14.1	0.57	53.6	<0.02	<0.1	0.11	0.67	0.24	*1.45*	2.52	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW238	5/09/2023	0089_MW238_230905	Normal	EP2312177	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW239	5/09/2023	0089_MW239_230905	Normal	EP2312177	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW240	5/09/2023	0089_MW240_230905	Normal	EP2312187	<0.02	0.06	2.59	0.02	0.01	<0.02	<0.1	<0.02	0.10	0.03	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW242	4/09/2023	0089_MW242_230904	Normal	EP2312225	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW243	5/09/2023	0089_MW243_230905	Normal	EP2312177	<0.02	<0.02	0.07	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW245	5/09/2023	0089_MW245_230905	Normal	EP2312177	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW249	4/09/2023	0089_MW249_230904	Normal	EP2312225	<0.02	<0.02	0.25	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW249	4/09/2023	0089_QC106_230904	Field Duplicate	EP2312225	<0.02	<0.02	0.25	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	MW249	4/09/2023	0089_QC206_230904	Interlab Duplicate	1023399	<0.01	<0.01	0.25	<0.01	0.12	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
Fire Station, Flammable/Hazardous Goods and Waste Storage, Ship Sullage	MW255	5/09/2023	0089_MW255_230905	Normal	EP2312187	0.53	0.48	11.4	0.04	0.65	<0.02	0.2	0.22	1.21	0.30	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
	MW256	5/09/2023	0089_MW256_230905	Normal	EP2312187	2.11	1.67	6.35	0.26	5.69	<0.02	0.5	0.72	3.60	0.27	0.31	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.21	<0.05	<0.05
	MW257	5/09/2023	0089_MW257_230905	Normal	EP2312187	<0.02	<0.02	0.16	<0.02	0.36	<0.02	<0.1	0.11	0.08	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
	MW258	5/09/2023	0089_MW258_230905	Normal	EP2312187	0.47	0.35	1.56	0.12	2.81	<0.02	0.4	1.38	1.24	0.33	0.18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.20	<0.05	<0.05
	MW259	5/09/2023	0089_MW259_230905	Normal	EP2312187	<0.02	<0.02	0.09	<0.02	0.08	<0.02	<0.1	0.12	0.09	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
	MW259	5/09/2023	0089_QC117_230905	Field Duplicate	EP2312187	<0.02	<0.02	0.10	<0.02	0.09	<0.02	<0.1	0.14	0.09	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
	MW259	5/09/2023	0089_QC217_230905	Interlab Duplicate	1023399	0.01	0.01	0.09	<0.01	0.09	<0.01	<0.05	0.13	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids			
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01
PFAS NEMP 2020 Drinking Water											*0.56*											
PFAS NEMP 2020 Interim Marine 99%					0.00023*						19											
PFAS NEMP 2020 Recreational Water											**10**											
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
Dredge Spoil / Careening Bay	**MW268**	**4/09/2023**	**0089_MW268_230904**	**Normal**	**EP2312225**	0.09	0.09	0.32	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**MW269**	**4/09/2023**	**0089_MW269_230904**	**Normal**	**EP2312225**	0.05	0.07	0.31	<0.02	0.31	<0.02	<0.1	<0.02	0.08	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Accomodation Area	**MW288**	**5/09/2023**	**0089_MW288_230905**	**Normal**	**EP2312177**	<0.02	<0.02	<0.01	<0.02	0.64	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Accomodation Area	**MW289**	**4/09/2023**	**0089_MW289_230904**	**Normal**	**EP2312225**	0.03	0.04	0.32	0.02	1.16	<0.02	<0.1	<0.02	0.04	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW496**	**4/09/2023**	**0089_MW496_230904**	**Normal**	**EP2312225**	0.04	0.06	0.99	0.09	7.52	<0.02	<0.1	<0.02	0.16	0.03	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**MW500**	**5/09/2023**	**0089_MW500_230905**	**Normal**	**EP2312170**	1.60	2.06	16.1	3.45	44.4	<0.02	0.8	0.96	3.94	0.48	*1.20*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW516**	**4/09/2023**	**0089_MW516_230904**	**Normal**	**EP2312225**	<0.02	0.02	0.51	0.08	4.80	<0.02	<0.1	0.03	0.08	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW304**	**5/09/2023**	**0089_PW304_230905**	**Normal**	**EP2312178**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW306**	**4/09/2023**	**0089_PW306_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW307**	**4/09/2023**	**0089_PW307_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW308**	**4/09/2023**	**0089_PW308_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW314**	**4/09/2023**	**0089_PW314_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW315**	**4/09/2023**	**0089_PW315_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW316**	**4/09/2023**	**0089_PW316_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW329**	**11/09/2023**	**0089_PW329_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW330**	**11/09/2023**	**0089_PW330_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW331**	**11/09/2023**	**0089_PW331_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**PW335**	**5/09/2023**	**0089_PW335_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**PW340**	**5/09/2023**	**0089_PW340_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**PW340**	**5/09/2023**	**0089_QC118_230905**	**Field Duplicate**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**PW340**	**5/09/2023**	**0089_QC218_230905**	**Interlab Duplicate**	**1023399**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**PW341**	**5/09/2023**	**0089_PW341_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW345**	**5/09/2023**	**0089_PW345_230905**	**Normal**	**EP2312172**	<0.02	<0.02	<0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Accomodation Area	**PW346**	**5/09/2023**	**0089_PW346_230905**	**Normal**	**EP2312178**	<0.02	<0.02	0.02	<0.02	0.24	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW350**	**5/09/2023**	**0089_PW350_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW351**	**5/09/2023**	**0089_PW351_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW352**	**5/09/2023**	**0089_PW352_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW356**	**11/09/2023**	**0089_PW356_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW357**	**11/09/2023**	**0089_PW357_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW358**	**11/09/2023**	**0089_PW358_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**PW362**	**5/09/2023**	**0089_PW362_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**PW363**	**5/09/2023**	**0089_PW363_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**PW364**	**5/09/2023**	**0089_PW364_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW367**	**5/09/2023**	**0089_PW367_230905**	**Normal**	**EP2312172**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW368**	**5/09/2023**	**0089_PW368_230905**	**Normal**	**EP2312178**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW369**	**5/09/2023**	**0089_PW369_230905**	**Normal**	**EP2312172**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW374**	**4/09/2023**	**0089_PW374_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids			
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01
PFAS NEMP 2020 Drinking Water											*0.56*											
PFAS NEMP 2020 Interim Marine 99%					0.00023*						19											
PFAS NEMP 2020 Recreational Water											**10**											
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
Dredge Spoil / Careening Bay	**PW375**	**4/09/2023**	**0089_PW375_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW378**	**4/09/2023**	**0089_PW378_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW378**	**4/09/2023**	**0089_QC102_230904**	**Field Duplicate**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW378**	**4/09/2023**	**0089_QC202_230904**	**Interlab Duplicate**	**1023399**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
WWTP (West)	**PW380**	**5/09/2023**	**0089_PW380_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW381**	**5/09/2023**	**0089_PW381_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW401**	**5/09/2023**	**0089_PW401_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW405**	**5/09/2023**	**0089_PW405_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW407**	**5/09/2023**	**0089_PW407_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW407**	**5/09/2023**	**0089_QC112_230905**	**Field Duplicate**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW407**	**5/09/2023**	**0089_QC212_230905**	**Interlab Duplicate**	**1023399**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
HSF	**PW409**	**4/09/2023**	**0089_PW409_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW411**	**4/09/2023**	**0089_PW411_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW411**	**4/09/2023**	**0089_QC110_230904**	**Field Duplicate**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW411**	**4/09/2023**	**0089_QC210_230904**	**Interlab Duplicate**	**1023399**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
HSF	**PW413**	**4/09/2023**	**0089_PW413_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**PW415**	**4/09/2023**	**0089_PW415_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**SW130**	**5/09/2023**	**0089_SW130_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**SW132**	**5/09/2023**	**0089_SW132_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
FTA	**SW134**	**5/09/2023**	**0089_SW134_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**SW150**	**11/09/2023**	**0089_SW150_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**SW152**	**11/09/2023**	**0089_SW152_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**SW154**	**11/09/2023**	**0089_SW154_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**SW156**	**11/09/2023**	**0089_SW156_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**SW305**	**5/09/2023**	**0089_SW305_230905**	**Normal**	**EP2312178**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**SW309**	**4/09/2023**	**0089_SW309_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**SW310**	**4/09/2023**	**0089_SW310_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**SW311**	**4/09/2023**	**0089_SW311_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**SW317**	**4/09/2023**	**0089_QC101_230904**	**Field Duplicate**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**SW317**	**4/09/2023**	**0089_QC201_230904**	**Interlab Duplicate**	**1023399**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
Dredge Spoil / Careening Bay	**SW317**	**4/09/2023**	**0089_SW317_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**SW318**	**4/09/2023**	**0089_SW318_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**SW319**	**4/09/2023**	**0089_SW319_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**SW353**	**5/09/2023**	**0089_SW353_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**SW370**	**5/09/2023**	**0089_SW370_230905**	**Normal**	**EP2312172**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**SW371**	**5/09/2023**	**0089_SW371_230905**	**Normal**	**EP2312178**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**SW372**	**5/09/2023**	**0089_SW372_230905**	**Normal**	**EP2312178**	<0.02	<0.02	0.04	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**SW373**	**5/09/2023**	**0089_SW373_230905**	**Normal**	**EP2312178**	<0.02	<0.02	0.01	<0.02	0.20	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**SW382**	**5/09/2023**	**0089_SW382_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**SW383**	**5/09/2023**	**0089_SW383_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**SW384**	**5/09/2023**	**0089_SW384_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**SW406**	**5/09/2023**	**0089_SW406_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**SW408**	**5/09/2023**	**0089_SW408_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**SW410**	**4/09/2023**	**0089_QC107_230904**	**Field Duplicate**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**SW410**	**4/09/2023**	**0089_QC207_230904**	**Interlab Duplicate**	**1023399**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
HSF	**SW410**	**4/09/2023**	**0089_SW410_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**SW412**	**4/09/2023**	**0089_QC109_230904**	**Field Duplicate**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**SW412**	**4/09/2023**	**0089_QC209_230904**	**Interlab Duplicate**	**1023399**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
HSF	**SW412**	**4/09/2023**	**0089_SW412_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**SW414**	**4/09/2023**	**0089_SW414_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
HSF	**SW416**	**4/09/2023**	**0089_SW416_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water
Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.
Notes:
First-lime detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

					PFAS - Perfluoroalkyl Sulfonamides							PFAS			Inorganics								Metals			
					Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water												*0.07*															
PFAS NEMP 2020 Interim Marine 99%																											
PFAS NEMP 2020 Recreational Water												**2**															
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**																							
		4/09/2023	0089_QC301_230904	Rinsate	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		4/09/2023	0089_QC302_230904	Rinsate	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		4/09/2023	0089_QC401_230904	Field Blank	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		4/09/2023	0089_QC402_230904	Field Blank	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		5/09/2023	0089_QC303_230905	Rinsate	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		5/09/2023	0089_QC304_230905	Rinsate	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		5/09/2023	0089_QC305_230905	Rinsate	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		5/09/2023	0089_QC306_230905	Rinsate	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		5/09/2023	0089_QC403_230905	Field Blank	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		5/09/2023	0089_QC404_230905	Field Blank	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		5/09/2023	0089_QC405_230905	Field Blank	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		5/09/2023	0089_QC406_230905	Field Blank	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		11/09/2023	0089_QC307_230911	Rinsate	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		11/09/2023	0089_QC407_230911	Field Blank	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
FTA	MW109	5/09/2023	0089_MW109_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.57***	3.02	3.23	<1	298	<1	298	9.21	9.40	102	1.05	18	116	18	<1	49
FTA	MW112	5/09/2023	0089_MW112_230905	Normal	0.37	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***41.4***	44.4	46.5	<1	214	<1	214	5.38	5.63	28	2.28	15	84	9	<1	16
FTA	MW112	5/09/2023	0089_QC116_230905	Field Duplicate	0.34	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***38.2***	40.8	42.8													
FTA	MW112	5/09/2023	0089_QC216_230905	Interlab Duplicate	0.32	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***43***	45.59	47.13													
FTA	MW120	5/09/2023	0089_MW120_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.86***	3.08	3.40	<1	303	<1	303	8.54	7.44	75	6.93	18	90	19	3	30
FTA	MW120	5/09/2023	0089_QC115_230905	Field Duplicate	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.83***	3.02	3.32													
FTA	MW120	5/09/2023	0089_QC215_230905	Interlab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***3***	3.17	3.42													
FTA	MW121	5/09/2023	0089_MW121_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.96*	1.11	1.16	<1	590	<1	590	13.2	6.69	43	32.9	12	90	14	2	23
FTA	MW123	5/09/2023	0089_MW123_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.48*	0.64	0.70	<1	436	<1	436	13.1	14.0	154	3.38	3	136	29	3	110
FTA	MW123	5/09/2023	0089_QC114_230905	Field Duplicate	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.48*	0.64	0.70	<1	277	<1	277	8.38	8.01	95	2.28	8	94	14	3	48
FTA	MW123	5/09/2023	0089_QC214_230905	Interlab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.58*	0.73	0.8													
FTA	MW124	5/09/2023	0089_MW124_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	381	<1	381	434	520	13,800	9.00	1,790	452	1,160	430	8,990
FTA	MW125	5/09/2023	0089_MW125_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.40*	0.62	0.72	<1	416	<1	416	419	474	13,200	6.09	1,850	433	1,120	393	8,040
FTA	MW126	5/09/2023	0089_MW126_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	506	<1	506	231	216	7,080	3.47	1,040	247	557	182	3,520
FTA	MW127	5/09/2023	0089_MW127_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	608	<1	608	424	452	13,400	3.15	1,640	392	1,130	359	7,590
FTA	MW128	5/09/2023	0089_MW128_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.54*	1.57	1.57	<1	587	<1	587	15.5	9.13	120	25.8	17	104	24	2	44
Demolition Ground	MW139	11/09/2023	0089_MW139_230911	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	219	<1	219	48.8	44.0	1,430	5.18	198	112	104	32	668
Demolition Ground	MW141	11/09/2023	0089_MW141_230911	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***40.3***	44.7	46.1	<1	448	<1	448	334	343	10,500	1.28	1,410	396	781	301	5,780
Demolition Ground	MW142	11/09/2023	0089_MW142_230911	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.46***	11.4	11.8	<1	385	<1	385	352	372	11,100	2.80	1,490	384	843	340	6,320
Demolition Ground	MW147	11/09/2023	0089_MW147_230911	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	463	<1	463	156	160	4,790	1.18	556	248	357	121	2,640
Demolition Ground	MW149	11/09/2023	0089_MW149_230911	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	220	<1	220	543	616	17,300	6.33	2,420	464	1,390	514	10,700
WWTP	MW158	4/09/2023	0089_MW158_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	434	<1	434	151	143	4,680	2.63	483	185	330	104	2,390
WWTP	MW161	4/09/2023	0089_MW161_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.89***	3.11	3.16	<1	376	<1	376	31.5	28.7	669	4.61	246	82	66	35	421
WWTP	MW161	4/09/2023	0089_QC104_230904	Field Duplicate	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.96***	3.19	3.22													
WWTP	MW161	4/09/2023	0089_QC204_230904	Interlab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***2.76***	2.99	3.04													
WWTP	MW166	4/09/2023	0089_MW166_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.54***	5.32	5.49	<1	388	<1	388	36.9	35.4	909	2.07	167	110	97	40	480
WWTP	MW171	4/09/2023	0089_MW171_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.80***	9.66	11.1	<1	498	<1	498	62.9	65.3	1,670	1.84	282	101	175	58	1,020
WWTP	MW173	4/09/2023	0089_MW173_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.27***	4.87	5.28	<1	485	<1	485	31.5	29.9	729	2.58	58	138	87	22	351
WWTP	MW193	4/09/2023	0089_MW193_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.59***	4.42	4.84	<1	410	<1	410	21.4	18.5	380	7.16	120	112	55	10	188
WWTP	MW195D	4/09/2023	0089_MW195D_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	319	<1	319	256	262	7,890	1.06	1,300	316	639	222	4,310
WWTP	MW195D	4/09/2023	0089_QC105_230904	Field Duplicate	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
WWTP	MW195D	4/09/2023	0089_QC205_230904	Interlab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.01	<0.05	<0.1													
WWTP	MW200	5/09/2023	0089_MW200_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	464	<1	464	63.4	67.7	1,760	3.28	214	90	98	63	1,230
WWTP	MW202	5/09/2023	0089_MW202_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	380	<1	380	16.3	14.8	266	4.81	56	101	28	8	166
WWTP	MW203	5/09/2023	0089_MW203_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.05	0.05	<1	331	<1	331	15.5	13.6	174	6.43	191	61	59	13	124
HSF	MW214	4/09/2023	0089_MW214_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	382	<1	382	25.5	22.7	607	5.92	37	157	41	6	260
HSF	MW215	4/09/2023	0089_MW215_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.49*	0.57	0.62	<1	256	<1	256	12.5	11.2	220	5.58	59	98	22	5	101
HSF	MW216	4/09/2023	0089_MW216_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.86*	22.4	22.6	<1	314	<1	314	28.1	25.6	642	4.58	178	136	49	11	334
HSF	MW217	4/09/2023	0089_MW217_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	31.3	31.3	<1	293	<1	293	7.42	7.02	34	2.71	29	93	12	7	28
HSF	MW220	4/09/2023	0089_MW220_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.18***	5.50	5.58	<1	263	<1	263	7.48	6.55	64	6.60	20	80	12	7	32
HSF	MW224	4/09/2023	0089_MW224_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	288	<1	288	9.39	8.65	101	4.14	38	64	22	3	82
HSF	MW225	5/09/2023	0089_MW225_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
HSF	MW226	4/09/2023	0089_MW226_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	623	<1	623	458	471	14,200	1.39	2,150	409	1,110	495	7,960
HSF	MW227	5/09/2023	0089_MW227_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	381	<1	381	32.3	27.8	716	7.46	216	90	60	27	407
HSF	MW228	5/09/2023	0089_MW228_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.36*	10.0	10.2	<1	749	<1	749	91.3	87.0	2,380	2.37	440	121	242	92	1,350
HSF	MW233	4/09/2023	0089_MW233_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	114	<1	114	2.87	2.39	16	9.15	7	29	4	2	13
HSF	MW236	5/09/2023	0089_MW236_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***67.7***	70.4	73.8	<1	264	<1	264	6.54	6.43	31	0.86	19	85	15	<1	22
HSF	MW238	5/09/2023	0089_MW238_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	238	<1	238	6.37	6.01	30	2.88	37	73	13	5	27
HSF	MW239	5/09/2023	0089_MW239_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	208	<1	208	6.22	6.81	48	4.53	34	81	11	3	41
HSF	MW240	5/09/2023	0089_MW240_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.60***	2.81	2.89	<1	261	<1	261	7.60	6.92	55	4.67	40	92	11	3	31
HSF	MW242	4/09/2023	0089_MW242_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	184	<1	184	4.66	4.17	18	5.56	23	57	10	1	11
HSF	MW243	5/09/2023	0089_MW243_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	309	<1	309	9.18	8.79	57	2.17	67	110	16	6	42
HSF	MW245	5/09/2023	0089_MW245_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	413	<1	413	9.05	9.02	24	0.16	6	138	15	3	19
HSF	MW249	4/09/2023	0089_MW249_230904	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.36*	0.36	0.36	<1	464	<1	464	14.9	12.9	156	7.00	58	101	42	5	99
HSF	MW249	4/09/2023	0089_QC106_230904	Field Duplicate	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.36*	0.36	0.36													
HSF	MW249	4/09/2023	0089_QC206_230904	Interlab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.37*	0.37	0.37													
Fire Station, Flammable/Hazardous Goods and Waste Storage, Ship Sullage	MW255	5/09/2023	0089_MW255_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***12.0***	14.6	15.1	<1	341	<1	341	9.58	8.85	76	3.95	30	90	23	3	55
	MW256	5/09/2023	0089_MW256_230905	Normal	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***12.0***	19.8	21.7	<1	427	<1	427	15.0	12.7	210	8.38	26	103	30	6	113
	MW257	5/09/2023	0089_MW257_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.52*	0.74	0.74	<1	128	<1	128	3.16	3.50	17	5.06	6	51	6	1	10
	MW258	5/09/2023	0089_MW258_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.37***	8.57	9.04	<1	325	<1	325	16.0	15.2	234	2.51	139	130	46	16	104
	MW259	5/09/2023	0089_MW259_230905	Normal	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.17*	0.38	0.38	<1	301	<1	301	7.03	7.44	28	2.85	11	106	15	2	20
	MW259	5/09/2023	0089_QC117_230905	Field Duplicate	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.19*	0.42	0.42	<1	307	<1	307	7.15	7.45	28	2.04	11	107	15	2	19
	MW259	5/09/2023	0089_QC217_230905	Interlab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.18*	0.39	0.4													

					PFAS - Perfluoroalkyl Sulfonamides							PFAS			Inorganics								Metals			
					Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water												*0.07*															
PFAS NEMP 2020 Interim Marine 99%																											
PFAS NEMP 2020 Recreational Water												**2**															
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**																							
Dredge Spoil / Careening Bay	**MW268**	**4/09/2023**	**0089_MW268_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.32*	0.47	0.56	<1	440	<1	440	39.0	39.2	656	0.30	563	162	151	27	415
Dredge Spoil / Careening Bay	**MW269**	**4/09/2023**	**0089_MW269_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.62*	0.76	0.83	<1	456	<1	456	18.6	15.9	279	7.98	79	69	60	14	164
Accomodation Area	**PW288**	**5/09/2023**	**0089_MW288_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.64*	0.64	0.64	<1	309	<1	309	7.84	7.07	40	5.18	26	87	15	4	32
Accomodation Area	**MW289**	**4/09/2023**	**0089_MW289_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.48*	1.57	1.63	<1	528	<1	528	12.9	9.03	52	17.7	44	86	23	6	62
AVCAT Storage and Fuel Farm	**MW496**	**4/09/2023**	**0089_MW496_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.51***	8.84	8.99	<1	375	<1	375	14.9	12.8	194	7.30	92	65	38	12	142
FTA	**MW500**	**5/09/2023**	**0089_MW500_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***60.5***	69.5	75.0	<1	425	<1	425	10.9	8.94	59	9.70	34	128	17	1	26
AVCAT Storage and Fuel Farm	**MW516**	**4/09/2023**	**0089_MW516_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.31***	5.48	5.58	<1	517	<1	517	13.2	12.1	92	4.29	11	103	42	10	74
WWTP (East)	**PW304**	**5/09/2023**	**0089_PW304_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	254	<1	254	598	646	19,200	3.88	2,470	465	1,440	513	11,300
HSF	**PW306**	**4/09/2023**	**0089_PW306_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	120	<1	120	604	618	19,400	1.12	2,620	432	1,430	515	10,700
HSF	**PW307**	**4/09/2023**	**0089_PW307_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	582	663	18,600	6.52	2,640	450	1,480	566	11,600
HSF	**PW308**	**4/09/2023**	**0089_PW308_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	591	663	18,800	5.75	2,800	453	1,480	563	11,600
HSF	**PW314**	**4/09/2023**	**0089_PW314_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	608	629	19,500	1.71	2,650	440	1,450	524	10,900
HSF	**PW315**	**4/09/2023**	**0089_PW315_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	570	646	18,200	6.27	2,600	443	1,440	555	11,300
HSF	**PW316**	**4/09/2023**	**0089_PW316_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	596	654	19,100	4.64	2,610	450	1,470	559	11,400
Demolition Ground	**PW329**	**11/09/2023**	**0089_PW329_230911**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	135	<1	135	577	648	18,500	5.78	2,530	454	1,460	539	11,300
Demolition Ground	**PW330**	**11/09/2023**	**0089_PW330_230911**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	146	<1	146	581	654	18,600	5.92	2,560	452	1,480	539	11,400
Demolition Ground	**PW331**	**11/09/2023**	**0089_PW331_230911**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	148	<1	148	575	654	18,400	6.45	2,540	455	1,480	539	11,400
FTA	**PW335**	**5/09/2023**	**0089_PW335_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	150	<1	150	575	642	18,400	5.52	2,540	442	1,440	561	11,200
FTA	**PW340**	**5/09/2023**	**0089_PW340_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	136	<1	136	595	638	19,200	3.45	2,440	431	1,410	504	11,200
FTA	**PW340**	**5/09/2023**	**0089_QC118_230905**	**Field Duplicate**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	136	<1	136	573	632	18,400	4.90	2,460	426	1,400	500	11,100
FTA	**PW340**	**5/09/2023**	**0089_QC218_230905**	**Interlab Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
FTA	**PW341**	**5/09/2023**	**0089_PW341_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	598	625	19,300	2.22	2,440	434	1,400	548	10,900
WWTP (East)	**PW345**	**5/09/2023**	**0089_PW345_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	152	<1	152	577	616	18,600	3.26	2,370	436	1,360	487	10,800
Accomodation Area	**PW346**	**5/09/2023**	**0089_PW346_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.26*	0.26	0.26	<1	153	<1	153	556	603	17,800	4.05	2,430	430	1,350	523	10,500
WWTP (West)	**PW350**	**5/09/2023**	**0089_PW350_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	591	648	19,000	4.62	2,530	436	1,430	510	11,400
WWTP (West)	**PW351**	**5/09/2023**	**0089_PW351_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	571	637	18,300	5.50	2,510	428	1,410	504	11,200
WWTP (West)	**PW352**	**5/09/2023**	**0089_PW352_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	607	626	19,600	1.58	2,480	421	1,390	496	11,000
Demolition Ground	**PW356**	**11/09/2023**	**0089_PW356_230911**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	146	<1	146	572	653	18,300	6.63	2,540	455	1,470	534	11,400
Demolition Ground	**PW357**	**11/09/2023**	**0089_PW357_230911**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	144	<1	144	580	654	18,500	6.02	2,650	456	1,480	540	11,400
Demolition Ground	**PW358**	**11/09/2023**	**0089_PW358_230911**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	132	<1	132	559	648	17,800	7.35	2,610	450	1,460	536	11,300
FTA	**PW362**	**5/09/2023**	**0089_PW362_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	594	653	19,100	4.76	2,520	450	1,460	571	11,400
FTA	**PW363**	**5/09/2023**	**0089_PW363_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	127	<1	127	586	642	18,800	4.52	2,580	441	1,440	564	11,200
FTA	**PW364**	**5/09/2023**	**0089_PW364_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	132	<1	132	579	618	18,600	3.26	2,500	427	1,380	540	10,800
WWTP (East)	**PW367**	**5/09/2023**	**0089_PW367_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	141	<1	141	574	621	18,500	3.88	2,390	429	1,370	491	10,900
WWTP (East)	**PW368**	**5/09/2023**	**0089_PW368_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	225	<1	225	567	612	18,200	3.77	2,380	442	1,360	487	10,700
WWTP (East)	**PW369**	**5/09/2023**	**0089_PW369_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	173	<1	173	572	632	18,300	5.02	2,500	448	1,390	495	11,100
Dredge Spoil / Careening Bay	**PW374**	**4/09/2023**	**0089_PW374_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	120	<1	120	602	617	19,300	1.23	2,660	436	1,420	515	10,700

	PFAS - Perfluoroalkyl Sulfonamides							PFAS			Inorganics									Metals			
	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water								*0.07*															
PFAS NEMP 2020 Interim Marine 99%																							
PFAS NEMP 2020 Recreational Water								**2**															
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**																					
Dredge Spoil / Careening Bay	**PW375**	**4/09/2023**	**0089_PW375_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	595	610	19,200	1.18	2,470	425	1,390	509	10,600
Dredge Spoil / Careening Bay	**PW378**	**4/09/2023**	**0089_PW378_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	151	<1	151	602	612	19,300	0.83	2,600	430	1,410	512	10,600
Dredge Spoil / Careening Bay	**PW378**	**4/09/2023**	**0089_QC102_230904**	**Field Duplicate**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	131	<1	131	599	612	19,300	1.04	2,500	429	1,410	513	10,600
Dredge Spoil / Careening Bay	**PW378**	**4/09/2023**	**0089_QC202_230904**	**Interlab Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
WWTP (West)	**PW380**	**5/09/2023**	**0089_PW380_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	608	636	19,600	2.32	2,500	425	1,400	500	11,200
WWTP (West)	**PW381**	**5/09/2023**	**0089_PW381_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	599	638	19,300	3.12	2,500	431	1,410	502	11,200
WWTP (West)	**PW401**	**5/09/2023**	**0089_PW401_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	600	643	19,300	3.41	2,560	427	1,420	506	11,300
HSF	**PW405**	**5/09/2023**	**0089_PW405_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	585	641	18,800	4.54	2,520	441	1,430	560	11,200
HSF	**PW407**	**5/09/2023**	**0089_PW407_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	578	642	18,600	5.28	2,420	443	1,440	561	11,200
HSF	**PW407**	**5/09/2023**	**0089_QC112_230905**	**Field Duplicate**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	132	<1	132	591	685	19,000	7.38	2,520	469	1,520	577	12,000
HSF	**PW407**	**5/09/2023**	**0089_QC212_230905**	**Interlab Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
HSF	**PW409**	**4/09/2023**	**0089_PW409_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	127	<1	127	558	595	17,900	3.26	2,420	420	1,380	505	10,300
HSF	**PW411**	**4/09/2023**	**0089_PW411_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	592	619	19,000	2.24	2,560	434	1,440	517	10,700
HSF	**PW411**	**4/09/2023**	**0089_QC110_230904**	**Field Duplicate**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
HSF	**PW411**	**4/09/2023**	**0089_QC210_230904**	**Interlab Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
HSF	**PW413**	**4/09/2023**	**0089_PW413_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	586	624	18,600	3.07	2,840	441	1,440	522	10,800
HSF	**PW415**	**4/09/2023**	**0089_PW415_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	568	619	18,200	4.29	2,500	432	1,440	519	10,700
FTA	**SW130**	**5/09/2023**	**0089_SW130_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	129	<1	129	577	650	18,500	6.01	2,510	444	1,440	546	11,400
FTA	**SW132**	**5/09/2023**	**0089_SW132_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	585	638	18,900	4.30	2,370	431	1,410	508	11,200
FTA	**SW134**	**5/09/2023**	**0089_SW134_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	129	<1	129	599	641	19,300	3.39	2,500	439	1,430	561	11,200
Demolition Ground	**SW150**	**11/09/2023**	**0089_SW150_230911**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	162	<1	162	564	638	18,000	6.20	2,530	449	1,450	532	11,100
Demolition Ground	**SW152**	**11/09/2023**	**0089_SW152_230911**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	148	<1	148	571	644	18,300	5.94	2,510	452	1,460	537	11,200
Demolition Ground	**SW154**	**11/09/2023**	**0089_SW154_230911**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	137	<1	137	598	654	19,200	4.51	2,560	454	1,480	538	11,400
Demolition Ground	**SW156**	**11/09/2023**	**0089_SW156_230911**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	576	654	18,500	6.31	2,500	451	1,480	542	11,400
WWTP (East)	**SW305**	**5/09/2023**	**0089_SW305_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	158	<1	158	542	582	17,400	3.57	2,310	407	1,290	472	10,200
HSF	**SW309**	**4/09/2023**	**0089_SW309_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	585	658	18,600	5.82	2,790	446	1,470	554	11,500
HSF	**SW310**	**4/09/2023**	**0089_SW310_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	554	628	17,700	6.30	2,490	444	1,430	555	10,900
HSF	**SW311**	**4/09/2023**	**0089_SW311_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	558	628	17,900	5.87	2,450	443	1,430	554	10,900
Dredge Spoil / Careening Bay	**SW317**	**4/09/2023**	**0089_QC101_230904**	**Field Duplicate**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
Dredge Spoil / Careening Bay	**SW317**	**4/09/2023**	**0089_QC201_230904**	**Interlab Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
Dredge Spoil / Careening Bay	**SW317**	**4/09/2023**	**0089_SW317_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	131	<1	131	561	635	17,900	6.25	2,550	438	1,420	543	11,100
Dredge Spoil / Careening Bay	**SW318**	**4/09/2023**	**0089_SW318_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	577	625	18,500	4.04	2,520	434	1,410	533	10,900
Dredge Spoil / Careening Bay	**SW319**	**4/09/2023**	**0089_SW319_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	131	<1	131	572	652	18,300	6.62	2,530	448	1,460	552	11,400
WWTP (West)	**SW353**	**5/09/2023**	**0089_SW353_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	572	643	18,400	5.77	2,450	428	1,420	505	11,300
WWTP (East)	**SW370**	**5/09/2023**	**0089_SW370_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	138	<1	138	605	616	19,500	0.90	2,510	421	1,370	489	10,800
WWTP (East)	**SW371**	**5/09/2023**	**0089_SW371_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	143	<1	143	523	614	16,600	8.02	2,480	414	1,350	483	10,800
WWTP (East)	**SW372**	**5/09/2023**	**0089_SW372_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	0.10	<1	154	<1	154	551	580	17,700	2.50	2,350	406	1,300	509	10,100
WWTP (West)	**SW373**	**5/09/2023**	**0089_SW373_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.21*	0.21	0.21	<1	133	<1	133	566	581	18,200	1.34	2,400	409	1,320	509	10,100
WWTP (West)	**SW382**	**5/09/2023**	**0089_SW382_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	562	633	18,000	5.92	2,500	429	1,410	500	11,100
WWTP (West)	**SW383**	**5/09/2023**	**0089_SW383_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	127	<1	127	564	633	18,100	5.80	2,420	427	1,410	500	11,100
WWTP (West)	**SW384**	**5/09/2023**	**0089_SW384_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	626	648	20,300	1.75	2,440	434	1,430	508	11,400
HSF	**SW406**	**5/09/2023**	**0089_SW406_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	574	647	18,400	5.94	2,540	447	1,450	548	11,300
HSF	**SW408**	**5/09/2023**	**0089_SW408_230905**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	132	<1	132	576	641	18,500	5.36	2,460	444	1,430	543	11,200
HSF	**SW410**	**4/09/2023**	**0089_QC107_230904**	**Field Duplicate**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
HSF	**SW410**	**4/09/2023**	**0089_QC207_230904**	**Interlab Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
HSF	**SW410**	**4/09/2023**	**0089_SW410_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	132	<1	132	553	652	17,700	8.24	2,450	464	1,490	582	11,300
HSF	**SW412**	**4/09/2023**	**0089_QC109_230904**	**Field Duplicate**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
HSF	**SW412**	**4/09/2023**	**0089_QC209_230904**	**Interlab Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
HSF	**SW412**	**4/09/2023**	**0089_SW412_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	568	623	18,200	4.64	2,480	440	1,420	554	10,800
HSF	**SW414**	**4/09/2023**	**0089_SW414_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	573	623	18,400	4.15	2,480	442	1,420	551	10,800
HSF	**SW416**	**4/09/2023**	**0089_SW416_230904**	**Normal**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	558	617	17,900	5.00	2,450	438	1,410	544	10,700

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water

HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%

HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First-time detection of PFOA or PFHxS+PFOS

New exceedance of guideline value

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
WWTP	SD304	5/09/2023	0089_SD304_230905	Normal	EP2312180	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	4/09/2023	0089_SD306_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	4/09/2023	0089_SD307_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	4/09/2023	0089_SD308_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	4/09/2023	0089_SD314_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	4/09/2023	0089_SD315_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	4/09/2023	0089_SD316_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	SD329	11/09/2023	0089_SD329_230911	Normal	EP2312526	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	SD330	11/09/2023	0089_SD330_230911	Normal	EP2312526	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	SD331	11/09/2023	0089_SD331_230911	Normal	EP2312526	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD335	5/09/2023	0089_SD335_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD340	5/09/2023	0089_SD340_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD341	5/09/2023	0089_SD341_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD345	5/09/2023	0089_SD345_230905	Normal	EP2312171	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accomodation Area	SD346	5/09/2023	0089_SD346_230905	Normal	EP2312180	<0.0002	<0.0002	<0.0002	<0.0002	0.0013	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD350	5/09/2023	0089_SD350_230905	Normal	EP2312186	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD351	5/09/2023	0089_SD351_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD352	5/09/2023	0089_SD352_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	SD356	11/09/2023	0089_SD356_230911	Normal	EP2312526	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	SD357	11/09/2023	0089_SD357_230911	Normal	EP2312526	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	SD358	11/09/2023	0089_SD358_230911	Normal	EP2312526	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD362	5/09/2023	0089_SD362_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD363	5/09/2023	0089_SD363_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	5/09/2023	0089_QC113_230905	Field Duplicate	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	5/09/2023	0089_QC213_230905	Interlab Duplicate	1023399	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	SD364	5/09/2023	0089_SD364_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	5/09/2023	0089_SD367_230905	Normal	EP2312171	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	5/09/2023	0089_SD368_230905	Normal	EP2312180	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	5/09/2023	0089_SD369_230905	Normal	EP2312171	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and careening bay	SD374	4/09/2023	0089_SD374_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and careening bay	SD375	4/09/2023	0089_SD375_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and careening bay	SD378	4/09/2023	0089_QC103_230904	Field Duplicate	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and careening bay	SD378	4/09/2023	0089_QC203_230904	Interlab Duplicate	1023399	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dredge spoil and careening bay	SD378	4/09/2023	0089_SD378_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD380	5/09/2023	0089_SD380_230905	Normal	EP2312186	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	5/09/2023	0089_SD381_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	5/09/2023	0089_SD401_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	5/09/2023	0089_SD405_230905	Normal	EP2312186	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	5/09/2023	0089_SD407_230905	Normal	EP2312186	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	4/09/2023	0089_QC108_230904	Field Duplicate	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	4/09/2023	0089_QC208_230904	Interlab Duplicate	1023399	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
HSF	SD409	4/09/2023	0089_SD409_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	4/09/2023	0089_QC111_230904	Field Duplicate	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	4/09/2023	0089_QC211_230904	Interlab Duplicate	1023399	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
HSF	SD411	4/09/2023	0089_SD411_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	4/09/2023	0089_SD413_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	4/09/2023	0089_SD415_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005

Notes:

First-time detection of PFOA or PFHxS+PFOS

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0005	0.0005	0.0005	0.0005	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
WWTP	**SD304**	**5/09/2023**	**0089_SD304_230905**	**Normal**	**EP2312180**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD306**	**4/09/2023**	**0089_SD306_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD307**	**4/09/2023**	**0089_SD307_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD308**	**4/09/2023**	**0089_SD308_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD314**	**4/09/2023**	**0089_SD314_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD315**	**4/09/2023**	**0089_SD315_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD316**	**4/09/2023**	**0089_SD316_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD329**	**11/09/2023**	**0089_SD329_230911**	**Normal**	**EP2312526**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD330**	**11/09/2023**	**0089_SD330_230911**	**Normal**	**EP2312526**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD331**	**11/09/2023**	**0089_SD331_230911**	**Normal**	**EP2312526**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD335**	**5/09/2023**	**0089_SD335_230905**	**Normal**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD340**	**5/09/2023**	**0089_SD340_230905**	**Normal**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD341**	**5/09/2023**	**0089_SD341_230905**	**Normal**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD345**	**5/09/2023**	**0089_SD345_230905**	**Normal**	**EP2312171**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
Accomodation Area	**SD346**	**5/09/2023**	**0089_SD346_230905**	**Normal**	**EP2312180**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0013	0.0013	0.0013
WWTP	**SD350**	**5/09/2023**	**0089_SD350_230905**	**Normal**	**EP2312186**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**5/09/2023**	**0089_SD351_230905**	**Normal**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**5/09/2023**	**0089_SD352_230905**	**Normal**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD356**	**11/09/2023**	**0089_SD356_230911**	**Normal**	**EP2312526**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD357**	**11/09/2023**	**0089_SD357_230911**	**Normal**	**EP2312526**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD358**	**11/09/2023**	**0089_SD358_230911**	**Normal**	**EP2312526**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**5/09/2023**	**0089_SD362_230905**	**Normal**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**5/09/2023**	**0089_SD363_230905**	**Normal**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD364**	**5/09/2023**	**0089_QC113_230905**	**Field Duplicate**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD364**	**5/09/2023**	**0089_QC213_230905**	**Interlab Duplicate**	**1023399**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	**SD364**	**5/09/2023**	**0089_SD364_230905**	**Normal**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD367**	**5/09/2023**	**0089_SD367_230905**	**Normal**	**EP2312171**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD368**	**5/09/2023**	**0089_SD368_230905**	**Normal**	**EP2312180**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	**SD369**	**5/09/2023**	**0089_SD369_230905**	**Normal**	**EP2312171**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and careening bay	**SD374**	**4/09/2023**	**0089_SD374_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and careening bay	**SD375**	**4/09/2023**	**0089_SD375_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and careening bay	**SD378**	**4/09/2023**	**0089_QC103_230904**	**Field Duplicate**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and careening bay	**SD378**	**4/09/2023**	**0089_QC203_230904**	**Interlab Duplicate**	**1023399**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Dredge spoil and careening bay	**SD378**	**4/09/2023**	**0089_SD378_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**5/09/2023**	**0089_SD380_230905**	**Normal**	**EP2312186**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD381**	**5/09/2023**	**0089_SD381_230905**	**Normal**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD401**	**5/09/2023**	**0089_SD401_230905**	**Normal**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD405**	**5/09/2023**	**0089_SD405_230905**	**Normal**	**EP2312186**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD407**	**5/09/2023**	**0089_SD407_230905**	**Normal**	**EP2312186**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD409**	**4/09/2023**	**0089_QC108_230904**	**Field Duplicate**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD409**	**4/09/2023**	**0089_QC208_230904**	**Interlab Duplicate**	**1023399**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
HSF	**SD409**	**4/09/2023**	**0089_SD409_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD411**	**4/09/2023**	**0089_QC111_230904**	**Field Duplicate**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD411**	**4/09/2023**	**0089_QC211_230904**	**Interlab Duplicate**	**1023399**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
HSF	**SD411**	**4/09/2023**	**0089_SD411_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD413**	**4/09/2023**	**0089_SD413_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD415**	**4/09/2023**	**0089_SD415_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Notes:

First-time detection of PFOA or PFHxS+PFOS

			Date	04 Sep 2023	04 Sep 2023		04 Sep 2023	04 Sep 2023		04 Sep 2023	04 Sep 2023		04 Sep 2023	04 Sep 2023	
			Field ID	0089_MW161_230904	0089_QC204_230904		0089_MW195D_230904	0089_QC205_230904		0089_MW249_230904	0089_QC106_230904		0089_MW249_230904	0089_QC206_230904	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2312225	1023399	RPD	EP2312225	1023399	RPD	EP2312225	EP2312225	RPD	EP2312225	1023399	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0.02	0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.26	0.26	0	<0.01	0.01	0	0.25	0.25	0	0.25	0.25	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	0.03	0.03	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	2.63	2.5	5	<0.01	<0.01	0	0.11	0.11	0	0.11	0.12	9
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01		<0.01			<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0.06	0.07	15	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0.09	0.08	12	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	0.04	0.04	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.03	0.03	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01	2.89	2.76	5	<0.01	0.01	0	0.36	0.36	0	0.36	0.37	3
Sum of PFAS (WA DER List)	µg/L	0.01	3.11	2.99	4	<0.01	<0.05	0	0.36	0.36	0	0.36	0.37	3
Sum of PFAS	µg/L	0.01	3.16	3.04	4	<0.01	<0.1	0	0.36	0.36	0	0.36	0.37	3

**RPDs have only been considered where a concentration is greater than 1 times the LOR.
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

		Date	04 Sep 2023	04 Sep 2023		04 Sep 2023	04 Sep 2023		04 Sep 2023	04 Sep 2023		04 Sep 2023	04 Sep 2023	
		Field ID	0089_PW378_230904	0089_QC102_230904		0089_PW378_230904	0089_QC202_230904		0089_PW411_230904	0089_QC210_230904		0089_SW317_230904	0089_QC101_230904	
		Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
		Lab Report Number	EP2312225	EP2312225	RPD	EP2312225	1023399	RPD	EP2312225	1023399	RPD	EP2312228	EP2312228	RPD
	Unit	LOR												
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01			<0.01				
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS														
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.05	0	<0.01	<0.01	0
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.1	0	<0.01	<0.01	0

		Date	04 Sep 2023	04 Sep 2023		04 Sep 2023	04 Sep 2023		04 Sep 2023	04 Sep 2023		04 Sep 2023	04 Sep 2023	
		Field ID	0089_SW317_230904	0089_QC201_230904		0089_SW410_230904	0089_QC107_230904		0089_SW410_230904	0089_QC207_230904		0089_SW412_230904	0089_QC209_230904	
		Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
		Lab Report Number	EP2312228	1023399	RPD	EP2312228	EP2312228	RPD	EP2312228	1023399	RPD	EP2312228	1023399	RPD
	Unit	LOR												
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01		<0.01						<0.01			<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS														
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.05	0
Sum of PFAS	µg/L	0.01	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.1	0

			Date	05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023	
			Field ID	0089_PW407_230905	0089_QC112_230905		0089_PW407_230905	0089_QC212_230905		0089_MW123_230905	0089_QC114_230905		0089_MW123_230905	0089_QC214_230905	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2312184	EP2312184	RPD	EP2312184	1023399	RPD	EP2312170	EP2312170	RPD	EP2312170	1023399	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	0.09	0.08	12	0.09	0.09	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	0.06	0.06	0	0.06	0.05	18
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	0.47	0.47	0	0.47	0.57	19
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	0.01	0.01	0	0.01	0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01						<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05		<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	0.07	0.08	13	0.07	0.05	33
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	0.48	0.48	0	0.48	0.58	19
Sum of PFAS (WA DER List)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.05	0	0.64	0.64	0	0.64	0.73	13
Sum of PFAS	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.1	0	0.70	0.70	0	0.70	0.8	13

			Date	05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023	
			Field ID	0089_MW120_230905	0089_QC115_230905		0089_MW120_230905	0089_QC215_230905		0089_MW112_230905	0089_QC116_230905		0089_MW112_230905	0089_QC216_230905	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2312170	EP2312170	RPD	EP2312170	1023399	RPD	EP2312170	EP2312170	RPD	EP2312170	1023399	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		0.02	<0.02	0	0.02	0.02	0	0.08	0.08	0	0.08	0.06	29
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		0.04	0.04	0	0.04	0.03	29	0.27	0.27	0	0.27	0.27	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		1.60	1.62	1	1.60	1.7	6	11.0	10.2	8	11.0	11	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		0.28	0.26	7	0.28	0.22	**24**	1.44	1.37	5	1.44	0.90	**46**
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01		1.26	1.21	4	1.26	1.3	3	30.4	28.0	8	30.4	32	5
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01						<0.01						<0.1	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.1	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05		<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	0.07	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		<0.02	<0.02	0	<0.02	0.01	0	0.13	0.12	8	0.13	0.14	7
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		0.08	0.08	0	0.08	0.05	46	0.70	0.63	11	0.70	0.52	**30**
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	0.35	0.32	9	0.35	0.29	19
Perfluorooctanoic acid (PFOA)	µg/L	0.01		0.12	0.11	9	0.12	0.09	29	1.58	1.37	14	1.58	1.4	12
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	0.03	0.03	0	0.03	0.03	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	0.12	0.11	9	0.12	0.11	9
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	0.37	0.34	8	0.37	0.32	14
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01		2.86	2.83	1	2.86	3	5	41.4	38.2	8	41.4	43	4
Sum of PFAS (WA DER List)	µg/L	0.01		3.08	3.02	2	3.08	3.17	3	44.4	40.8	8	44.4	45.59	3
Sum of PFAS	µg/L	0.01		3.40	3.32	2	3.40	3.42	1	46.5	42.8	8	46.5	47.13	1

			Date	05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023	
			Field ID	0089_MW259_230905	0089_QC117_230905		0089_MW259_230905	0089_QC217_230905		0089_PW340_230905	0089_QC118_230905		0089_PW340_230905	0089_QC218_230905	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2312187	EP2312187	RPD	EP2312187	1023399	RPD	EP2312188	EP2312188	RPD	EP2312188	1023399	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.09	0.10	11	0.09	0.09	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.08	0.09	12	0.08	0.09	12	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0.12	0.14	15	0.12	0.13	8	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0.09	0.09	0	0.09	0.07	25	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01	0.17	0.19	11	0.17	0.18	6	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	0.38	0.42	10	0.38	0.39	3	<0.01	<0.01	0	<0.01	<0.05	0
Sum of PFAS	µg/L	0.01	0.38	0.42	10	0.38	0.4	5	<0.01	<0.01	0	<0.01	<0.1	0

Date			04 Sep 2023	04 Sep 2023		04 Sep 2023	04 Sep 2023		04 Sep 2023	04 Sep 2023		04 Sep 2023	04 Sep 2023	
Field ID			0089_SD378_230904	0089_QC103_230904		0089_SD378_230904	0089_QC203_230904		0089_SD409_230904	0089_QC208_230904		0089_SD411_230904	0089_QC211_230904	
Matrix Type			Sediment	Sediment		Sediment	Sediment		Sediment	Sediment		Sediment	Sediment	
Lab Report Number			EP2312228	EP2312228	RPD	EP2312228	1023399	RPD	EP2312228	1023399	RPD	EP2312228	1023399	RPD
	Unit	LOR												
Sample Preparation														
Moisture Content	%	0.1	17.2	14.5	17	17.2	19	10	30.3	29	4	13.9	15	8
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluorononanesulfonic acid (PFNS)	mg/kg	0.005					<0.005			<0.005			<0.005	
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.005	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.01	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.01	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.01	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.005	0	<0.0005	<0.005	0
PFAS														
Sum of PFHxS and PFOS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.005	0	<0.0002	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.01	0	<0.0002	<0.01	0
Sum of PFAS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.05	0	<0.0002	<0.05	0	<0.0002	<0.05	0

**RPDs have only been considered where a concentration is greater than 1 times the LOR.
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

			Date	05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023	
			Field ID	0089_SD364_230905	0089_QC113_230905		0089_SD364_230905	0089_QC213_230905	
			Matrix Type	Sediment	Sediment		Sediment	Sediment	
			Lab Report Number	EP2312190	EP2312190	RPD	EP2312190	1023399	RPD
	Unit	LOR							
Sample Preparation									
Moisture Content	%	0.1	26.2	28.8	9	26.2	32	20
PFAS - Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanesulfonic acid (PFNS)	mg/kg	0.005					<0.005	
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS									
Sum of PFHxS and PFOS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0
Sum of PFAS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.05	0

APPENDIX

C

LABORATORY CERTIFICATES

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Stantec

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2312170

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager** [redacted]

ALS Compass COC Reference: ~~56861~~, 56863, 56862, 56859, 56864, 56856

 # Samples: 56858 56898 56905 56870 56871 56902 56903 **Phone:** [redacted]

Sampler: [redacted]

Phone: [redacted]

Turnaround Requirements: Standard ____ Urgent ____

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 05/09/2023	Date / Time: 6/9 1030	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 56871 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW128		05/09/2023 09:29 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_MW123		05/09/2023 09:51 AM	WATER	ALS: 5 Non ALS: 0	No		X		Extra pfas bottles for lab qc
003	0089_QC114		05/09/2023 09:52 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_MW121		05/09/2023 10:04 AM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_MW120		05/09/2023 10:18 AM	WATER	ALS: 3 Non ALS: 0	No		X		
006	0089_QC115		05/09/2023 10:20 AM	WATER	ALS: 4 Non ALS: 0	No	X			Extra pfas bottles for lab WC
007	0089_MW112		05/09/2023 10:40 AM	WATER	ALS: 3 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 56871 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_QC116		05/09/2023 10:41 AM	WATER	ALS: 2 Non ALS: 0	No	X			
009	0089_MW109		05/09/2023 10:54 AM	WATER	ALS: 3 Non ALS: 0	No		X		
010	0089_MW500		05/09/2023 11:05 AM	WATER	ALS: 3 Non ALS: 0	No		X		
011	0089_MW200		05/09/2023 12:09 PM	WATER	ALS: 3 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: 56871 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

009	0089_MW109	HDPE (no PTFE)	20 mL	00350822082770	Grey	No	
009	0089_MW109	HDPE (no PTFE)	20 mL	00350822082822	Grey	No	
009	0089_MW109	Clear Plastic Bottle - Natural	125 mL	00070522068276	Green	No	
010	0089_MW500	HDPE (no PTFE)	20 mL	00350822081572	Grey	No	
010	0089_MW500	HDPE (no PTFE)	20 mL	00350822057823	Grey	No	
010	0089_MW500	Clear Plastic Bottle - Natural	125 mL	00070522045842	Green	No	
011	0089_MW200	HDPE (no PTFE)	20 mL	00350822062467	Grey	No	
011	0089_MW200	HDPE (no PTFE)	20 mL	00350822062404	Grey	No	
011	0089_MW200	Clear Plastic Bottle - Natural	125 mL	00070522068339	Green	No	

Total Bottle Count: ALS: 35, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312170**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 56871	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2023 10:30	Issue Date	: 06-Sep-2023
Client Requested Due Date	: 15-Sep-2023	Scheduled Reporting Date	: **15-Sep-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 10.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2312170-001	05-Sep-2023 09:29	0089_MW128_230905	✓	✓
EP2312170-002	05-Sep-2023 09:51	0089_MW123_230905	✓	✓
EP2312170-003	05-Sep-2023 09:52	0089_QC114_230905	✓	✓
EP2312170-004	05-Sep-2023 10:04	0089_MW121_230905	✓	✓
EP2312170-005	05-Sep-2023 10:18	0089_MW120_230905	✓	✓
EP2312170-006	05-Sep-2023 10:20	0089_QC115_230905	✓	
EP2312170-007	05-Sep-2023 10:40	0089_MW112_230905	✓	✓
EP2312170-008	05-Sep-2023 10:41	0089_QC116_230905	✓	
EP2312170-009	05-Sep-2023 10:54	0089_MW109_230905	✓	✓
EP2312170-010	05-Sep-2023 11:05	0089_MW500_230905	✓	✓
EP2312170-011	05-Sep-2023 12:09	0089_MW200_230905	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312170**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56871	Issue Date	: 15-Sep-2023 21:55
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Lab Technichian	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits for sample #1 and 4 due to analytes not quantified in this report. Major anions (ED041G/ED045G) have been confirmed by re-analysis. Insufficient sample volume to confirm alkalinity and major cations. Please scrutinise results accordingly.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW128_230905	0089_MW123_230905	0089_QC114_230905	0089_MW121_230905	0089_MW120_230905
				Sampling date / time	05-Sep-2023 09:29	05-Sep-2023 09:51	05-Sep-2023 09:52	05-Sep-2023 10:04	05-Sep-2023 10:18
Compound	CAS Number	LOR	Unit		EP2312170-001	EP2312170-002	EP2312170-003	EP2312170-004	EP2312170-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		587	436	277	590	303
Total Alkalinity as CaCO3	----	1	mg/L		587	436	277	590	303
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		17	3	8	12	18
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		120	154	95	43	75
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		104	136	94	90	90
Magnesium	7439-95-4	1	mg/L		24	29	14	14	19
Sodium	7440-23-5	1	mg/L		44	110	48	23	30
Potassium	7440-09-7	1	mg/L		2	3	3	2	3
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		15.5	13.1	8.38	13.2	8.54
ø Total Cations	----	0.01	meq/L		9.13	14.0	8.01	6.69	7.44
ø Ionic Balance	----	0.01	%		25.8	3.38	2.28	32.9	6.93
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.03	0.09	0.08	<0.02	0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.06	0.06	<0.02	0.04
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.09	0.47	0.47	0.61	1.60
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	0.05	0.28
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		1.45	0.01	0.01	0.35	1.26
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	0.07	0.08	0.08	0.08

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW128_230905	0089_MW123_230905	0089_QC114_230905	0089_MW121_230905	0089_MW120_230905
				Sampling date / time	05-Sep-2023 09:29	05-Sep-2023 09:51	05-Sep-2023 09:52	05-Sep-2023 10:04	05-Sep-2023 10:18
Compound	CAS Number	LOR	Unit		EP2312170-001	EP2312170-002	EP2312170-003	EP2312170-004	EP2312170-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.05**	**0.12**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW128_230905	0089_MW123_230905	0089_QC114_230905	0089_MW121_230905	0089_MW120_230905
				Sampling date / time	05-Sep-2023 09:29	05-Sep-2023 09:51	05-Sep-2023 09:52	05-Sep-2023 10:04	05-Sep-2023 10:18
Compound	CAS Number	LOR	Unit		EP2312170-001	EP2312170-002	EP2312170-003	EP2312170-004	EP2312170-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**1.57**	**0.70**	**0.70**	**1.16**	**3.40**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.54**	**0.48**	**0.48**	**0.96**	**2.86**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.57**	**0.64**	**0.64**	**1.11**	**3.08**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	**105**	**105**	**110**	**114**
13C8-PFOA	----	0.02	%		**96.9**	**104**	**108**	**100**	**103**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC115_230905	0089_MW112_230905	0089_QC116_230905	0089_MW109_230905	0089_MW500_230905
				Sampling date / time	05-Sep-2023 10:20	05-Sep-2023 10:40	05-Sep-2023 10:41	05-Sep-2023 10:54	05-Sep-2023 11:05
Compound	CAS Number	LOR	Unit		EP2312170-006	EP2312170-007	EP2312170-008	EP2312170-009	EP2312170-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	<1	----	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	<1	----	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	214	----	298	425
Total Alkalinity as CaCO3	----	1	mg/L		----	214	----	298	425
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	15	----	18	34
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	28	----	102	59
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	84	----	116	128
Magnesium	7439-95-4	1	mg/L		----	9	----	18	17
Sodium	7440-23-5	1	mg/L		----	16	----	49	26
Potassium	7440-09-7	1	mg/L		----	<1	----	<1	1
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		----	5.38	----	9.21	10.9
ø Total Cations	----	0.01	meq/L		----	5.63	----	9.40	8.94
ø Ionic Balance	----	0.01	%		----	2.28	----	1.05	9.70
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.08	0.08	0.06	1.60
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.04	0.27	0.27	0.14	2.06
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		1.62	11.0	10.2	2.04	16.1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.26	1.44	1.37	0.07	3.45
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		1.21	30.4	28.0	0.53	44.4
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	0.8
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	0.13	0.12	0.03	0.96
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		0.08	0.70	0.63	0.26	3.94

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC115_230905	0089_MW112_230905	0089_QC116_230905	0089_MW109_230905	0089_MW500_230905
				Sampling date / time	05-Sep-2023 10:20	05-Sep-2023 10:40	05-Sep-2023 10:41	05-Sep-2023 10:54	05-Sep-2023 11:05
Compound	CAS Number	LOR	Unit		EP2312170-006	EP2312170-007	EP2312170-008	EP2312170-009	EP2312170-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.35**	**0.32**	**0.03**	**0.48**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.11**	**1.58**	**1.37**	**0.07**	**1.20**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.03**	**0.03**	<0.02	**0.02**
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	**0.37**	**0.34**	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	**0.12**	**0.11**	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC115_230905	0089_MW112_230905	0089_QC116_230905	0089_MW109_230905	0089_MW500_230905
				Sampling date / time	05-Sep-2023 10:20	05-Sep-2023 10:40	05-Sep-2023 10:41	05-Sep-2023 10:54	05-Sep-2023 11:05
Compound	CAS Number	LOR	Unit		EP2312170-006	EP2312170-007	EP2312170-008	EP2312170-009	EP2312170-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**3.32**	**46.5**	**42.8**	**3.23**	**75.0**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**2.83**	**41.4**	**38.2**	**2.57**	**60.5**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**3.02**	**44.4**	**40.8**	**3.02**	**69.5**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**113**	**65.0**	**68.2**	**99.2**	**66.1**
13C8-PFOA	----	0.02	%		**102**	**103**	**98.9**	**99.7**	**103**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW200_230905	----	----	----	----
				Sampling date / time	05-Sep-2023 12:09	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312170-011	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**464**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**464**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**214**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1760**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**90**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**98**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**1230**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**63**	----	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**63.4**	----	----	----	----
ø **Total Cations**	----	0.01	meq/L		**67.7**	----	----	----	----
ø **Ionic Balance**	----	0.01	%		**3.28**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW200_230905	----	----	----	----
				Sampling date / time	05-Sep-2023 12:09	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312170-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW200_230905	----	----	----	----
				Sampling date / time	05-Sep-2023 12:09	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312170-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	----	----	----	----
13C8-PFOA	----	0.02	%		**101**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	***Low***	***High***
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2312170**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56871	Issue Date	: 15-Sep-2023
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Lab Technichian	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5287398)									
EP2312170-002	0089_MW123_230905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	436	437	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	436	437	0.0	0% - 20%
EP2312416-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	162	160	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	162	160	0.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5281197)									
EP2312170-001	0089_MW128_230905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	17	18	0.0	0% - 50%
EP2312214-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	14	14	0.0	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 5281198)									
EP2312170-001	0089_MW128_230905	ED045G: Chloride	16887-00-6	1	mg/L	120	119	0.0	0% - 20%
EP2312214-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	436	437	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5283130)									
EP2312163-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EP2312170-009	0089_MW109_230905	ED093F: Calcium	7440-70-2	1	mg/L	116	109	6.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	18	18	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	49	48	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5284268)									
EP2312170-011	0089_MW200_230905	ED093F: Calcium	7440-70-2	1	mg/L	90	90	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	98	97	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1230	1230	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	63	64	0.0	0% - 20%
EP2312183-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	61	60	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	59	58	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	124	121	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5282908)									
EP2312170-002	0089_MW123_230905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.47	0.51	8.2	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.01	0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.09	0.08	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2312172-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5282908)									
EP2312170-002	0089_MW123_230905	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.07	0.07	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2312172-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5282908) - continued									
EP2312172-002	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5282908)									
EP2312170-002	0089_MW123_230905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2312172-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5282908)									
EP2312170-002	0089_MW123_230905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5282908) - continued									
EP2312172-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5282908)									
EP2312170-002	0089_MW123_230905	EP231X: Sum of PFAS	----	0.01	µg/L	0.70	0.73	4.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.48	0.52	8.0	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.64	0.67	4.6	0% - 20%
EP2312172-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5287398)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	97.0	91.2	110
				<1	200 mg/L	98.3	91.2	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281197)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	93.8	89.9	112
				<1	500 mg/L	99.8	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5281198)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	88.6	113
				<1	1000 mg/L	92.3	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5283130)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5284268)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5282908)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	95.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	98.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	83.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	87.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	81.9	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	83.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283243)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	107	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283243) - continued								
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	113	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	97.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	103	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	91.5	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5282908)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	80.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	85.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	89.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	87.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	80.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	81.4	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283243)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	101	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	106	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	98.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	116	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5282908)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	81.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	86.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	75.6	60.5	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5282908) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	83.3	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	82.1	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	86.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	79.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283243)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	95.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	101	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	107	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	121	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5282908)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	86.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	95.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	85.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	88.4	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283243)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	99.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	106	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	103	64.2	133
EP231P: PFAS Sums (QCLot: 5282908)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5283243)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5283243) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281197)							
EP2312170-001	0089_MW128_230905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	108	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5281198)							
EP2312170-001	0089_MW128_230905	ED045G: Chloride	16887-00-6	1000 mg/L	112	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5282908)							
EP2312170-006	0089_QC115_230905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	108	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	116	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	103	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	99.6	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5282908)							
EP2312170-006	0089_QC115_230905	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.8	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	99.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	103	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	98.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	102	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	109	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.4	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	108	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	116	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	108	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5282908)							
EP2312170-006	0089_QC115_230905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	96.8	59.0	135

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5282908) - continued							
EP2312170-006	0089_QC115_230905	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	98.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	87.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	107	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	102	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	90.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5282908)							
EP2312170-006	0089_QC115_230905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	103	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	100	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	100.0	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312170**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: Stirling GW - MB	Issue Date	: 15-Sep-2023
Sampler	: [redacted]	No. of samples received	: 11
Order number	: pfas-omp/Stirling	No. of samples analysed	: 11

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2312170--006	0089_QC115_230905	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2312170--006	0089_QC115_230905	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_MW128_230905,	0089_MW123_230905,	----	----	----	13-Sep-2023	12-Sep-2023	**1**
0089_QC114_230905,	0089_MW121_230905,						
0089_MW120_230905,	0089_MW112_230905,						
0089_MW109_230905,	0089_MW500_230905						

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
	2				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	32	6.25	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	32	3.13	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW128_230905, 0089_MW123_230905, 0089_QC114_230905, 0089_MW121_230905, 0089_MW120_230905, 0089_MW112_230905, 0089_MW109_230905, 0089_MW500_230905, 0089_MW200_230905	**05-Sep-2023**	**----**	----	----	**09-Sep-2023**	19-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW128_230905, 0089_MW123_230905, 0089_QC114_230905, 0089_MW121_230905, 0089_MW120_230905, 0089_MW112_230905, 0089_MW109_230905, 0089_MW500_230905, 0089_MW200_230905	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	03-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW128_230905, 0089_MW123_230905, 0089_QC114_230905, 0089_MW121_230905, 0089_MW120_230905, 0089_MW112_230905, 0089_MW109_230905, 0089_MW500_230905, 0089_MW200_230905	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	03-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW128_230905, 0089_MW123_230905, 0089_QC114_230905, 0089_MW121_230905, 0089_MW120_230905, 0089_MW112_230905, 0089_MW109_230905, 0089_MW500_230905	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	12-Sep-2023	×
Clear Plastic Bottle - Natural (ED093F)							
0089_MW200_230905	**05-Sep-2023**	**----**	----	----	**12-Sep-2023**	12-Sep-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW128_230905, 0089_MW123_230905, 0089_QC114_230905, 0089_MW121_230905, 0089_MW120_230905, 0089_QC115_230905, 0089_MW112_230905, 0089_QC116_230905, 0089_MW109_230905, 0089_MW500_230905, 0089_MW200_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW128_230905, 0089_QC114_230905, 0089_MW120_230905, 0089_MW112_230905, 0089_MW109_230905, 0089_MW200_230905, 0089_MW123_230905, 0089_MW121_230905, 0089_QC115_230905, 0089_QC116_230905, 0089_MW500_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW128_230905, 0089_QC114_230905, 0089_MW120_230905, 0089_MW112_230905, 0089_MW109_230905, 0089_MW200_230905, 0089_MW123_230905, 0089_MW121_230905, 0089_QC115_230905, 0089_QC116_230905, 0089_MW500_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW128_230905, 0089_QC114_230905, 0089_MW120_230905, 0089_MW112_230905, 0089_MW109_230905, 0089_MW200_230905, 0089_MW123_230905, 0089_MW121_230905, 0089_QC115_230905, 0089_QC116_230905, 0089_MW500_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW128_230905, 0089_QC114_230905, 0089_MW120_230905, 0089_MW112_230905, 0089_MW109_230905, 0089_MW200_230905, 0089_MW123_230905, 0089_MW121_230905, 0089_QC115_230905, 0089_QC116_230905, 0089_MW500_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	32	**3.13**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2312171

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

Phone: ( )

ALS Compass COC Reference: ~~56851~~, 56863, 56862, 56859, 56864, 56856

 # Samples: 56858 56898 56905 56870 56871 56902 56903 **Sampler:**

Phone: ( )

Turnaround Requirements: (Standard) Urgent

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 05/09/2023	Date / Time: 6/9 1030	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 56902 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY: [redacted]	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 6/9 1830	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD367		05/09/2023 11:37 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD345		05/09/2023 12:18 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD369		05/09/2023 12:29 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 56902 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD367	HDPE Soil Jar	200 mL	00621122079033	Grey	No	
002	0089_SD345	HDPE Soil Jar	200 mL	00621122106347	Grey	No	
003	0089_SD369	HDPE Soil Jar	200 mL	00621122078956	Grey	No	

Total Bottle Count: ALS: 3, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312171**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 56902	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2023 10:30	Issue Date	: 06-Sep-2023
Client Requested Due Date	: 15-Sep-2023	Scheduled Reporting Date	: **14-Sep-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 10.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2312171-001	05-Sep-2023 11:37	0089_SD367_230905	✓	✓
EP2312171-002	05-Sep-2023 12:18	0089_SD345_230905	✓	✓
EP2312171-003	05-Sep-2023 12:29	0089_SD369_230905	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312171**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: 56902	Issue Date	: 14-Sep-2023 14:07
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD367_230905	0089_SD345_230905	0089_SD369_230905	----	----
				Sampling date / time	05-Sep-2023 11:37	05-Sep-2023 12:18	05-Sep-2023 12:29	----	----
Compound	CAS Number	LOR	Unit		EP2312171-001	EP2312171-002	EP2312171-003	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**26.0**	**27.3**	**28.5**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD367_230905	0089_SD345_230905	0089_SD369_230905	----	----
				Sampling date / time	05-Sep-2023 11:37	05-Sep-2023 12:18	05-Sep-2023 12:29	----	----
Compound	CAS Number	LOR	Unit		EP2312171-001	EP2312171-002	EP2312171-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**108**	**120**	**107**	----	----
13C8-PFOA	----	0.0002	%		**102**	**98.5**	**93.0**	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2312171**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: 56902	Issue Date	: 14-Sep-2023
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5292627)									
EP2312171-001	0089_SD367_230905	EA055: Moisture Content	----	0.1	%	26.0	26.9	3.5	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5281119)									
EP2312171-001	0089_SD367_230905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2312180-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5281119)									
EP2312171-001	0089_SD367_230905	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5281119) - continued									
EP2312171-001	0089_SD367_230905	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2312180-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5281119)									
EP2312171-001	0089_SD367_230905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312180-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5281119)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5281119) - continued									
EP2312171-001	0089_SD367_230905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312180-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5281119)									
EP2312171-001	0089_SD367_230905	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2312180-003	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5281119)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	116	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	91.5	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	104	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	96.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5281119)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	106	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	110	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5281119)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.7	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281119)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281119) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	103	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	102	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	118	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	98.3	54.8	124
EP231P: PFAS Sums (QCLot: 5281119)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5281119)							
EP2312171-002	0089_SD345_230905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	120	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	113	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	104	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	109	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	105	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	111	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5281119)							
EP2312171-002	0089_SD345_230905	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	105	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	97.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	101	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	105	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	114	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	105	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	111	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	113	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	122	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	106	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5281119)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5281119) - continued							
EP2312171-002	0089_SD345_230905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	95.6	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	114	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	123	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	114	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	116	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	118	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281119)							
EP2312171-002	0089_SD345_230905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	106	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	109	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	102	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312171**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: Stirling SD - MB	Issue Date	: 14-Sep-2023
Sampler	: [redacted]	No. of samples received	: 3
Order number	: pfas-omp/Stirling	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD367_230905,	0089_SD345_230905,	**05-Sep-2023**	**----**	----	----	**12-Sep-2023**	19-Sep-2023	✓
0089_SD369_230905								
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD367_230905,	0089_SD345_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
0089_SD369_230905								
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD367_230905,	0089_SD345_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
0089_SD369_230905								
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD367_230905,	0089_SD345_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
0089_SD369_230905								
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD367_230905,	0089_SD345_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
0089_SD369_230905								
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD367_230905,	0089_SD345_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
0089_SD369_230905								

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2312172

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Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 Client: Stantec Project Manager: [redacted]

ALS Compass COC Reference: ~~56861~~, 56863, 56862, 56859, 56864, 56856 Phone:

Samples: 56898 56905 56870 56871 56902 56903 Sampler: [redacted] Phone: ( )

Turnaround Requirements: (Standard) Urgent

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 05/09/2023	Date / Time: 6/9 1030	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) COC#: 56903 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY: [redacted]	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 5/9 1530	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW367		05/09/2023 11:38 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_SW370		05/09/2023 11:58 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra pfas bottles for lab qc
003	0089_PW345		05/09/2023 12:19 PM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW369		05/09/2023 12:28 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 56903 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW367	HDPE (no PTFE)	20 mL	00350822075226	Grey	No	
001	0089_PW367	HDPE (no PTFE)	20 mL	00350822075282	Grey	No	
001	0089_PW367	Clear Plastic Bottle - Natural	125 mL	00070522045574	Green	No	
002	0089_SW370	HDPE (no PTFE)	20 mL	00350822062659	Grey	No	
002	0089_SW370	HDPE (no PTFE)	20 mL	00350822062580	Grey	No	
002	0089_SW370	HDPE (no PTFE)	20 mL	00351221006247	Grey	No	
002	0089_SW370	HDPE (no PTFE)	20 mL	00351221006027	Grey	No	
002	0089_SW370	Clear Plastic Bottle - Natural	125 mL	00070522067134	Green	No	
003	0089_PW345	HDPE (no PTFE)	20 mL	00350822062654	Grey	No	
003	0089_PW345	HDPE (no PTFE)	20 mL	00350822062575	Grey	No	
003	0089_PW345	Clear Plastic Bottle - Natural	125 mL	00070522067085	Green	No	
004	0089_PW369	HDPE (no PTFE)	20 mL	00350822062447	Grey	No	
004	0089_PW369	HDPE (no PTFE)	20 mL	00350822062476	Grey	No	
004	0089_PW369	Clear Plastic Bottle - Natural	125 mL	00070522067130	Green	No	

Total Bottle Count: ALS: 14, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312172**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 56903	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2023 10:30	Issue Date	: 06-Sep-2023
Client Requested Due Date	: 15-Sep-2023	Scheduled Reporting Date	: **15-Sep-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 10.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2312172-001	05-Sep-2023 11:38	0089_PW367_230905	✓	✓
EP2312172-002	05-Sep-2023 11:58	0089_SW370_230905	✓	✓
EP2312172-003	05-Sep-2023 12:19	0089_PW345_230905	✓	✓
EP2312172-004	05-Sep-2023 12:28	0089_PW369_230905	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312172**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56903	Issue Date	: 15-Sep-2023 14:54
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Lab Technichian	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW367_230905	0089_SW370_230905	0089_PW345_230905	0089_PW369_230905	----
				Sampling date / time	05-Sep-2023 11:38	05-Sep-2023 11:58	05-Sep-2023 12:19	05-Sep-2023 12:28	----
Compound	CAS Number	LOR	Unit		EP2312172-001	EP2312172-002	EP2312172-003	EP2312172-004	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		141	138	152	173	----
Total Alkalinity as CaCO3	----	1	mg/L		141	138	152	173	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2390	2510	2370	2500	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18500	19500	18600	18300	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		429	421	436	448	----
Magnesium	7439-95-4	1	mg/L		1370	1370	1360	1390	----
Sodium	7440-23-5	1	mg/L		10900	10800	10800	11100	----
Potassium	7440-09-7	1	mg/L		491	489	487	495	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		574	605	577	572	----
ø Total Cations	----	0.01	meq/L		621	616	616	632	----
ø Ionic Balance	----	0.01	%		3.88	0.90	3.26	5.02	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.02	<0.01	0.05	0.02	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW367_230905	0089_SW370_230905	0089_PW345_230905	0089_PW369_230905	----
				Sampling date / time	05-Sep-2023 11:38	05-Sep-2023 11:58	05-Sep-2023 12:19	05-Sep-2023 12:28	----
Compound	CAS Number	LOR	Unit		EP2312172-001	EP2312172-002	EP2312172-003	EP2312172-004	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW367_230905	0089_SW370_230905	0089_PW345_230905	0089_PW369_230905	----
				Sampling date / time	05-Sep-2023 11:38	05-Sep-2023 11:58	05-Sep-2023 12:19	05-Sep-2023 12:28	----
Compound	CAS Number	LOR	Unit		EP2312172-001	EP2312172-002	EP2312172-003	EP2312172-004	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	<0.01	**0.05**	**0.02**	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	**0.05**	**0.02**	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	<0.01	**0.05**	**0.02**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**107**	**102**	**101**	----
13C8-PFOA	----	0.02	%		**96.3**	**100**	**98.6**	**102**	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2312172**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56903	Issue Date	: 15-Sep-2023
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Lab Technichian	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5287429)									
EP2312172-002	0089_SW370_230905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	138	137	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	138	137	0.0	0% - 20%
EP2312223-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	357	357	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	357	357	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5281227)									
EP2312172-001	0089_PW367_230905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2390	2380	0.4	0% - 20%
EP2312184-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2460	2480	0.5	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5281228)									
EP2312172-001	0089_PW367_230905	ED045G: Chloride	16887-00-6	1	mg/L	18500	19400	4.8	0% - 20%
EP2312184-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18500	19800	6.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5284268)									
EP2312170-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	90	90	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	98	97	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1230	1230	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	63	64	0.0	0% - 20%
EP2312183-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	61	60	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	59	58	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	124	121	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5282908)									
EP2312170-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.47	0.51	8.2	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.01	0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.09	0.08	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2312172-002	0089_SW370_230905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5282908)									
EP2312170-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.07	0.07	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2312172-002	0089_SW370_230905	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5282908)									
EP2312170-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5282908) - continued									
EP2312170-002	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2312172-002	0089_SW370_230905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5282908)									
EP2312170-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2312172-002	0089_SW370_230905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5282908)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5282908) - continued									
EP2312170-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.70	0.73	4.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.48	0.52	8.0	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.64	0.67	4.6	0% - 20%
EP2312172-002	0089_SW370_230905	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5287429)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	91.2	110
				<1	200 mg/L	104	91.2	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281227)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.9	89.9	112
				<1	500 mg/L	101	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5281228)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.0	88.6	113
				<1	1000 mg/L	94.1	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5284268)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5282908)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	95.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	98.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	83.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	87.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	81.9	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	83.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283243)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	107	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	113	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	97.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	103	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	91.5	53.0	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5282908)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	80.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	85.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	89.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	87.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	80.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	81.4	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283243)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	101	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	106	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	98.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	116	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5282908)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	81.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	86.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	75.6	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	83.3	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	82.1	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	86.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	79.4	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283243)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	95.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	101	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	107	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	121	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5282908)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	86.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	95.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	85.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	88.4	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283243)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	99.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	106	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	103	64.2	133
EP231P: PFAS Sums (QCLot: 5282908)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5283243)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281227)							
EP2312172-001	0089_PW367_230905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5281228)							
EP2312172-001	0089_PW367_230905	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5282908)							
EP2312170-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	108	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	116	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	103	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	99.6	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5282908)							
EP2312170-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.8	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	99.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	103	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	98.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	102	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	109	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.4	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	108	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	116	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	108	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5282908)							
EP2312170-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	96.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	98.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	87.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	107	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	102	65.0	136

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5282908) - continued							
EP2312170-006	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	90.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5282908)							
EP2312170-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	103	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	100	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	100.0	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312172**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: Stirling SW/PW - MB	Issue Date	: 15-Sep-2023
Sampler	: [redacted]	No. of samples received	: 4
Order number	: pfas-omp/Stirling	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2312172--001	0089_PW367_230905	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2312172--001	0089_PW367_230905	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2312170--006	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2312170--006	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	32	6.25	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	32	3.13	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation* Date extracted	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW367_230905, 0089_SW370_230905, 0089_PW345_230905, 0089_PW369_230905	**05-Sep-2023**	**----**	----	**----**	**11-Sep-2023**	19-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_PW367_230905,	0089_SW370_230905,	**05-Sep-2023**	**----**	----	**----**	**15-Sep-2023**	03-Oct-2023	✓
0089_PW345_230905,	0089_PW369_230905							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_PW367_230905,	0089_SW370_230905,	**05-Sep-2023**	**----**	----	**----**	**15-Sep-2023**	03-Oct-2023	✓
0089_PW345_230905,	0089_PW369_230905							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_PW367_230905,	0089_SW370_230905,	**05-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	12-Sep-2023	✓
0089_PW345_230905,	0089_PW369_230905							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW367_230905,	0089_SW370_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_PW345_230905,	0089_PW369_230905							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW367_230905,	0089_SW370_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_PW345_230905,	0089_PW369_230905							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_PW367_230905,	0089_SW370_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_PW345_230905,	0089_PW369_230905							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW367_230905,	0089_SW370_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_PW345_230905,	0089_PW369_230905							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_PW367_230905,	0089_SW370_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_PW345_230905,	0089_PW369_230905							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	32	**3.13**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2312177

Telephone : – 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

ALS Compass COC Reference: 56858 **# Samples:** ~~56861~~, 56863, 56862, 56859, 56864, 56856, 56898, 56905, 56870, 56871, 56902, 56903 **Phone:** [redacted]

Sampler: [redacted]

Phone: [redacted]

Turnaround Requirements: Standard / Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 05/09/2023	Date / Time: 6/9 1030	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 56870 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW243		05/09/2023 09:15 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_MW238		05/09/2023 09:57 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_MW239		05/09/2023 10:08 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_MW245		05/09/2023 10:27 AM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_MW288		05/09/2023 11:00 AM	WATER	ALS: 3 Non ALS: 0	No		X		
006	0089_MW202		05/09/2023 12:44 PM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0089_QC303		05/09/2023 01:57 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

ALS COC#: 56870 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_QC304		05/09/2023 01:59 PM	WATER	ALS: 2 Non ALS: 0	No	X			
009	0089_QC305		05/09/2023 02:02 PM	WATER	ALS: 2 Non ALS: 0	No	X			
010	0089_QC306		05/09/2023 02:03 PM	WATER	ALS: 2 Non ALS: 0	No	X			
011	0089_QC403		05/09/2023 02:05 PM	WATER	ALS: 2 Non ALS: 0	No	X			
012	0089_QC404		05/09/2023 02:07 PM	WATER	ALS: 2 Non ALS: 0	No	X			
013	0089_QC405		05/09/2023 02:09 PM	WATER	ALS: 2 Non ALS: 0	No	X			
014	0089_QC406		05/09/2023 02:11 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

(ALS) COC#: 56870 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW243	Clear Plastic Bottle - Natural	125 mL	00070522045795	Green	No	
001	0089_MW243	HDPE (no PTFE)	20 mL	00350822075324	Grey	No	
001	0089_MW243	HDPE (no PTFE)	20 mL	00350822075157	Grey	No	
002	0089_MW238	Clear Plastic Bottle - Natural	125 mL	00070522067161	Green	No	
002	0089_MW238	HDPE (no PTFE)	20 mL	00350822082743	Grey	No	
002	0089_MW238	HDPE (no PTFE)	20 mL	00350822082737	Grey	No	
003	0089_MW239	Clear Plastic Bottle - Natural	125 mL	00070522067277	Green	No	
003	0089_MW239	HDPE (no PTFE)	20 mL	00350822082806	Grey	No	
003	0089_MW239	HDPE (no PTFE)	20 mL	00350822082900	Grey	No	
004	0089_MW245	HDPE (no PTFE)	20 mL	00350822082654	Grey	No	
004	0089_MW245	Clear Plastic Bottle - Natural	125 mL	00070522067174	Green	No	
004	0089_MW245	HDPE (no PTFE)	20 mL	00350822082755	Grey	No	
005	0089_MW288	HDPE (no PTFE)	20 mL	00350822062590	Grey	No	
005	0089_MW288	Clear Plastic Bottle - Natural	125 mL	00070522067498	Green	No	
005	0089_MW288	HDPE (no PTFE)	20 mL	00350822062597	Grey	No	
006	0089_MW202	HDPE (no PTFE)	20 mL	00350822007971	Grey	No	
006	0089_MW202	HDPE (no PTFE)	20 mL	00350822007752	Grey	No	
006	0089_MW202	Clear Plastic Bottle - Natural	125 mL	00070522068986	Green	No	
007	0089_QC303	HDPE (no PTFE)	20 mL	00351221005871	Grey	No	
007	0089_QC303	HDPE (no PTFE)	20 mL	00351221005904	Grey	No	
008	0089_QC304	HDPE (no PTFE)	20 mL	00351221005856	Grey	No	
008	0089_QC304	HDPE (no PTFE)	20 mL	00351221005857	Grey	No	
009	0089_QC305	HDPE (no PTFE)	20 mL	00351221005786	Grey	No	
009	0089_QC305	HDPE (no PTFE)	20 mL	00351221005723	Grey	No	
010	0089_QC306	HDPE (no PTFE)	20 mL	00351221006049	Grey	No	
010	0089_QC306	HDPE (no PTFE)	20 mL	00351221005841	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 56870 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

011	0089_QC403	HDPE (no PTFE)	20 mL	00351221005969	Grey	No	
011	0089_QC403	HDPE (no PTFE)	20 mL	00350822055016	Grey	No	
012	0089_QC404	HDPE (no PTFE)	20 mL	00351221005909	Grey	No	
012	0089_QC404	HDPE (no PTFE)	20 mL	00351221005820	Grey	No	
013	0089_QC405	HDPE (no PTFE)	20 mL	00351221006127	Grey	No	
013	0089_QC405	HDPE (no PTFE)	20 mL	00351221006283	Grey	No	
014	0089_QC406	HDPE (no PTFE)	20 mL	00351221006031	Grey	No	
014	0089_QC406	HDPE (no PTFE)	20 mL	00351221006074	Grey	No	

Total Bottle Count: ALS: 34, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312177**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 56870	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - ah		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2023 10:30	Issue Date	: 06-Sep-2023
Client Requested Due Date	: 15-Sep-2023	Scheduled Reporting Date	: **15-Sep-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 10.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 14 / 14

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2312177-001	05-Sep-2023 09:15	0089_MW243_230905	✓	✓
EP2312177-002	05-Sep-2023 09:57	0089_MW238_230905	✓	✓
EP2312177-003	05-Sep-2023 10:08	0089_MW239_230905	✓	✓
EP2312177-004	05-Sep-2023 10:27	0089_MW245_230905	✓	✓
EP2312177-005	05-Sep-2023 11:00	0089_MW288_230905	✓	✓
EP2312177-006	05-Sep-2023 12:44	0089_MW202_230905	✓	✓
EP2312177-007	05-Sep-2023 13:57	0089_QC303_230905	✓	
EP2312177-008	05-Sep-2023 13:59	0089_QC304_230905	✓	
EP2312177-009	05-Sep-2023 14:02	0089_QC305_230905	✓	
EP2312177-010	05-Sep-2023 14:03	0089_QC306_230905	✓	
EP2312177-011	05-Sep-2023 14:05	0089_QC403_230905	✓	
EP2312177-012	05-Sep-2023 14:07	0089_QC404_230905	✓	
EP2312177-013	05-Sep-2023 14:09	0089_QC405_230905	✓	
EP2312177-014	05-Sep-2023 14:11	0089_QC406_230905	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312177**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56870	Issue Date	: 15-Sep-2023 21:43
Sampler	: [redacted]		
Site	: Stirling GW - ah		
Quote number	: SY/139/19 B		
No. of samples received	: 14		
No. of samples analysed	: 14		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_230905	0089_MW238_230905	0089_MW239_230905	0089_MW245_230905	0089_MW288_230905
				Sampling date / time	05-Sep-2023 09:15	05-Sep-2023 09:57	05-Sep-2023 10:08	05-Sep-2023 10:27	05-Sep-2023 11:00
Compound	CAS Number	LOR	Unit		EP2312177-001	EP2312177-002	EP2312177-003	EP2312177-004	EP2312177-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		309	238	208	413	309
Total Alkalinity as CaCO3	----	1	mg/L		309	238	208	413	309
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		67	37	34	6	26
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		57	30	48	24	40
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		110	73	81	138	87
Magnesium	7439-95-4	1	mg/L		16	13	11	15	15
Sodium	7440-23-5	1	mg/L		42	27	41	19	32
Potassium	7440-09-7	1	mg/L		6	5	3	3	4
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		9.18	6.37	6.22	9.05	7.84
ø Total Cations	----	0.01	meq/L		8.79	6.01	6.81	9.02	7.07
ø Ionic Balance	----	0.01	%		2.17	2.88	4.53	0.16	5.18
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.07	0.03	0.01	0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	0.02	0.64
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_230905	0089_MW238_230905	0089_MW239_230905	0089_MW245_230905	0089_MW288_230905
				Sampling date / time	05-Sep-2023 09:15	05-Sep-2023 09:57	05-Sep-2023 10:08	05-Sep-2023 10:27	05-Sep-2023 11:00
Compound	CAS Number	LOR	Unit		EP2312177-001	EP2312177-002	EP2312177-003	EP2312177-004	EP2312177-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_230905	0089_MW238_230905	0089_MW239_230905	0089_MW245_230905	0089_MW288_230905
				Sampling date / time	05-Sep-2023 09:15	05-Sep-2023 09:57	05-Sep-2023 10:08	05-Sep-2023 10:27	05-Sep-2023 11:00
Compound	CAS Number	LOR	Unit		EP2312177-001	EP2312177-002	EP2312177-003	EP2312177-004	EP2312177-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.07**	**0.03**	**0.01**	**0.03**	**0.64**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.07**	**0.03**	**0.01**	**0.03**	**0.64**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.07**	**0.03**	**0.01**	**0.03**	**0.64**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.3**	**104**	**104**	**104**	**114**
13C8-PFOA	----	0.02	%		**101**	**100**	**104**	**104**	**97.6**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW202_230905	0089_QC303_230905	----	----	----
				Sampling date / time	05-Sep-2023 12:44	05-Sep-2023 13:57	----	----	----
Compound	CAS Number	LOR	Unit		EP2312177-006	EP2312177-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**380**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**380**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**56**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**266**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**101**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**28**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**166**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**8**	----	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**16.3**	----	----	----	----
ø **Total Cations**	----	0.01	meq/L		**14.8**	----	----	----	----
ø **Ionic Balance**	----	0.01	%		**4.81**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.01**	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW202_230905	0089_QC303_230905	----	----	----
				Sampling date / time	05-Sep-2023 12:44	05-Sep-2023 13:57	----	----	----
Compound	CAS Number	LOR	Unit		EP2312177-006	EP2312177-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW202_230905	0089_QC303_230905	----	----	----
				Sampling date / time	05-Sep-2023 12:44	05-Sep-2023 13:57	----	----	----
Compound	CAS Number	LOR	Unit		EP2312177-006	EP2312177-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.01**	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	**110**	----	----	----
13C8-PFOA	----	0.02	%		**102**	**103**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC304_230905	0089_QC305_230905	0089_QC306_230905	0089_QC403_230905	0089_QC404_230905
				Sampling date / time	05-Sep-2023 13:59	05-Sep-2023 14:02	05-Sep-2023 14:03	05-Sep-2023 14:05	05-Sep-2023 14:07
Compound	CAS Number	LOR	Unit		EP2312177-008	EP2312177-009	EP2312177-010	EP2312177-011	EP2312177-012
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC304_230905	0089_QC305_230905	0089_QC306_230905	0089_QC403_230905	0089_QC404_230905
				Sampling date / time	05-Sep-2023 13:59	05-Sep-2023 14:02	05-Sep-2023 14:03	05-Sep-2023 14:05	05-Sep-2023 14:07
Compound	CAS Number	LOR	Unit		EP2312177-008	EP2312177-009	EP2312177-010	EP2312177-011	EP2312177-012
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**106**	**110**	**107**	**106**
13C8-PFOA	----	0.02	%		**97.6**	**95.2**	**96.9**	**107**	**102**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC405_230905	0089_QC406_230905	----	----	----
				Sampling date / time	05-Sep-2023 14:09	05-Sep-2023 14:11	----	----	----
Compound	CAS Number	LOR	Unit		EP2312177-013	EP2312177-014	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC405_230905	0089_QC406_230905	----	----	----
				Sampling date / time	05-Sep-2023 14:09	05-Sep-2023 14:11	----	----	----
Compound	CAS Number	LOR	Unit		EP2312177-013	EP2312177-014	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**116**	**107**	----	----	----
13C8-PFOA	----	0.02	%		**96.5**	**96.4**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2312177**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56870	Issue Date	: 15-Sep-2023
Sampler	: [redacted]		
Site	: Stirling GW - ah		
Quote number	: SY/139/19 B		
No. of samples received	: 14		
No. of samples analysed	: 14		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5287429)									
EP2312172-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	138	137	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	138	137	0.0	0% - 20%
EP2312223-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	357	357	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	357	357	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5287432)									
EP2312177-005	0089_MW288_230905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	309	309	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	309	309	0.0	0% - 20%
EP2312183-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	608	613	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	608	613	0.7	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5281216)									
EP2312177-001	0089_MW243_230905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	67	66	0.0	0% - 20%
EP2312188-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2500	2470	1.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5281217)									
EP2312177-001	0089_MW243_230905	ED045G: Chloride	16887-00-6	1	mg/L	57	58	0.0	0% - 20%
EP2312188-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19300	19800	2.2	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5283125)									
EP2312161-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EP2312184-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	469	460	1.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1520	1500	1.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	11700	1.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	577	565	2.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5283130)									
EP2312163-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EP2312170-009	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	116	109	6.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	18	18	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	49	48	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5284268)									
EP2312170-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	90	90	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	98	97	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1230	1230	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	63	64	0.0	0% - 20%
EP2312183-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	61	60	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	59	58	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	124	121	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5282908)									
EP2312170-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.47	0.51	8.2	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.01	0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.09	0.08	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2312172-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5282908)									
EP2312170-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.07	0.07	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2312172-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5282908)									
EP2312170-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2312172-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5282908) - continued									
EP2312172-002	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5282908)									
EP2312170-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2312172-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5282908)									
EP2312170-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.70	0.73	4.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.48	0.52	8.0	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.64	0.67	4.6	0% - 20%
EP2312172-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5287429)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	91.2	110
				<1	200 mg/L	104	91.2	110
ED037P: Alkalinity by PC Titrator (QCLot: 5287432)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	98.2	91.2	110
				<1	200 mg/L	98.8	91.2	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281216)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.0	89.9	112
				<1	500 mg/L	95.1	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5281217)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	88.6	113
				<1	1000 mg/L	93.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5283125)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.4	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	94.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.8	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5283130)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5284268)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 5284268) - continued								
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5282908)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	95.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	98.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	83.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	87.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	81.9	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	83.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283243)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	107	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	113	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	97.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	103	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	91.5	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5282908)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	80.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	85.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	89.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	87.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	80.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	81.4	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283243)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	101	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283243) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	106	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	98.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	116	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5282908)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	81.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	86.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	75.6	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	83.3	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	82.1	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	86.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	79.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283243)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	95.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	101	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	107	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	121	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5282908)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	86.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	95.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	85.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	88.4	64.2	133

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283243)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	99.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	106	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	103	64.2	133
EP231P: PFAS Sums (QCLot: 5282908)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5283243)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281216)							
EP2312177-001	0089_MW243_230905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	105	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5281217)							
EP2312177-001	0089_MW243_230905	ED045G: Chloride	16887-00-6	1000 mg/L	93.0	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5282908)							
EP2312170-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	108	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	116	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	103	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	99.6	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5282908)							
EP2312170-006	Anonymous						

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5282908) - continued							
EP2312170-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.8	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	99.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	103	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	98.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	102	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	109	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.4	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	108	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	116	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	108	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5282908)							
EP2312170-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	96.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	98.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	87.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	107	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	102	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	90.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5282908)							
EP2312170-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	103	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	100	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	100.0	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312177**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: Stirling GW - ah	Issue Date	: 15-Sep-2023
Sampler	: [redacted]	No. of samples received	: 14
Order number	: pfas-omp/Stirling	No. of samples analysed	: 14

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2312170--006	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2312170--006	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_MW243_230905, 0089_MW239_230905, 0089_MW288_230905	0089_MW238_230905, 0089_MW245_230905,	----	----	----	13-Sep-2023	12-Sep-2023	1

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC 2	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	32	6.25	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	32	3.13	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW288_230905, 0089_MW202_230905	**05-Sep-2023**	**----**	----	----	**09-Sep-2023**	19-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW243_230905, 0089_MW238_230905, 0089_MW239_230905, 0089_MW245_230905	**05-Sep-2023**	**----**	----	----	**11-Sep-2023**	19-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW243_230905, 0089_MW238_230905, 0089_MW239_230905, 0089_MW245_230905, 0089_MW288_230905, 0089_MW202_230905	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	03-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW243_230905, 0089_MW238_230905, 0089_MW239_230905, 0089_MW245_230905, 0089_MW288_230905, 0089_MW202_230905	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	03-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW243_230905, 0089_MW238_230905, 0089_MW239_230905, 0089_MW245_230905, 0089_MW288_230905	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	12-Sep-2023	×
Clear Plastic Bottle - Natural (ED093F)							
0089_MW202_230905	**05-Sep-2023**	**----**	----	----	**12-Sep-2023**	12-Sep-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW243_230905, 0089_MW238_230905, 0089_MW239_230905, 0089_MW245_230905, 0089_MW288_230905, 0089_MW202_230905, 0089_QC303_230905, 0089_QC304_230905, 0089_QC305_230905, 0089_QC306_230905, 0089_QC403_230905, 0089_QC404_230905, 0089_QC405_230905, 0089_QC406_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW243_230905, 0089_MW238_230905, 0089_MW239_230905, 0089_MW245_230905, 0089_MW288_230905, 0089_MW202_230905, 0089_QC303_230905, 0089_QC304_230905, 0089_QC305_230905, 0089_QC306_230905, 0089_QC403_230905, 0089_QC404_230905, 0089_QC405_230905, 0089_QC406_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_MW243_230905,	0089_MW238_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_MW239_230905,	0089_MW245_230905,							
0089_MW288_230905,	0089_MW202_230905,							
0089_QC303_230905,	0089_QC304_230905,							
0089_QC305_230905,	0089_QC306_230905,							
0089_QC403_230905,	0089_QC404_230905,							
0089_QC405_230905,	0089_QC406_230905							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW243_230905,	0089_MW238_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_MW239_230905,	0089_MW245_230905,							
0089_MW288_230905,	0089_MW202_230905,							
0089_QC303_230905,	0089_QC304_230905,							
0089_QC305_230905,	0089_QC306_230905,							
0089_QC403_230905,	0089_QC404_230905,							
0089_QC405_230905,	0089_QC406_230905							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_MW243_230905,	0089_MW238_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_MW239_230905,	0089_MW245_230905,							
0089_MW288_230905,	0089_MW202_230905,							
0089_QC303_230905,	0089_QC304_230905,							
0089_QC305_230905,	0089_QC306_230905,							
0089_QC403_230905,	0089_QC404_230905,							
0089_QC405_230905,	0089_QC406_230905							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	6	48	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	48	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	48	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	32	**3.13**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2312178

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

Phone: ( )

ALS Compass COC Reference: 56858 ~~56851~~, 56863, 56862, 56859, 56864, 56856

 # Samples: 56898 56905 56870 56871 56902 56903

Sampler: [redacted]

Phone: ( )

Turnaround Requirements: (Standard) _____ Urgent _____

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 05/09/2023	Date / Time: 6/9 1030	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 56898 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY: [redacted]	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 6/9 1030	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - ah

ORDER NO: pfas-omp/Stirling

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW346		05/09/2023 11:04 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_SW373		05/09/2023 11:05 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_SW372		05/09/2023 11:06 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW304		05/09/2023 11:56 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_SW305		05/09/2023 11:56 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_PW368		05/09/2023 11:57 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_SW371		05/09/2023 11:58 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 56898 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW346	HDPE (no PTFE)	20 mL	00350822082896	Grey	No	
001	0089_PW346	Clear Plastic Bottle - Natural	125 mL	00070522067119	Green	No	
001	0089_PW346	HDPE (no PTFE)	20 mL	00350822082841	Grey	No	
002	0089_SW373	HDPE (no PTFE)	20 mL	00350821008503	Grey	No	
002	0089_SW373	HDPE (no PTFE)	20 mL	00350821008277	Grey	No	
002	0089_SW373	Clear Plastic Bottle - Natural	125 mL	00070522171518	Green	No	
003	0089_SW372	Clear Plastic Bottle - Natural	125 mL	00070522067103	Green	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00350822082611	Grey	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00350822082819	Grey	No	
004	0089_PW304	HDPE (no PTFE)	20 mL	00350822062553	Grey	No	
004	0089_PW304	HDPE (no PTFE)	20 mL	00350822062576	Grey	No	
004	0089_PW304	Clear Plastic Bottle - Natural	125 mL	00070522068431	Green	No	
005	0089_SW305	HDPE (no PTFE)	20 mL	00350822007982	Grey	No	
005	0089_SW305	HDPE (no PTFE)	20 mL	00350822007784	Grey	No	
005	0089_SW305	Clear Plastic Bottle - Natural	125 mL	00070522068980	Green	No	
006	0089_PW368	HDPE (no PTFE)	20 mL	00350822007871	Grey	No	
006	0089_PW368	HDPE (no PTFE)	20 mL	00350822064028	Grey	No	
006	0089_PW368	Clear Plastic Bottle - Natural	125 mL	00070522068981	Green	No	
007	0089_SW371	Clear Plastic Bottle - Natural	125 mL	00070522068925	Green	No	
007	0089_SW371	HDPE (no PTFE)	20 mL	00350822007770	Grey	No	
007	0089_SW371	HDPE (no PTFE)	20 mL	00350822007743	Grey	No	

Total Bottle Count: ALS: 21, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312178**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 56898	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - ah		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2023 10:30	Issue Date	: 06-Sep-2023
Client Requested Due Date	: 15-Sep-2023	Scheduled Reporting Date	: **15-Sep-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 10.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2312178-001	05-Sep-2023 11:04	0089_PW346_230905	✓	✓
EP2312178-002	05-Sep-2023 11:05	0089_SW373_230905	✓	✓
EP2312178-003	05-Sep-2023 11:06	0089_SW372_230905	✓	✓
EP2312178-004	05-Sep-2023 11:56	0089_PW304_230905	✓	✓
EP2312178-005	05-Sep-2023 11:56	0089_SW305_230905	✓	✓
EP2312178-006	05-Sep-2023 11:57	0089_PW368_230905	✓	✓
EP2312178-007	05-Sep-2023 11:58	0089_SW371_230905	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312178**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56898	Issue Date	: 15-Sep-2023 17:04
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - ah		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Lab Technichian	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW346_230905	0089_SW373_230905	0089_SW372_230905	0089_PW304_230905	0089_SW305_230905
				Sampling date / time	05-Sep-2023 11:04	05-Sep-2023 11:05	05-Sep-2023 11:06	05-Sep-2023 11:56	05-Sep-2023 11:56
Compound	CAS Number	LOR	Unit		EP2312178-001	EP2312178-002	EP2312178-003	EP2312178-004	EP2312178-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		153	133	154	254	158
Total Alkalinity as CaCO3	----	1	mg/L		153	133	154	254	158
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2430	2400	2350	2470	2310
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17800	18200	17700	19200	17400
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		430	409	406	465	407
Magnesium	7439-95-4	1	mg/L		1350	1320	1300	1440	1290
Sodium	7440-23-5	1	mg/L		10500	10100	10100	11300	10200
Potassium	7440-09-7	1	mg/L		523	509	509	513	472
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		556	566	551	598	542
ø Total Cations	----	0.01	meq/L		603	581	580	646	582
ø Ionic Balance	----	0.01	%		4.05	1.34	2.50	3.88	3.57
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.02	0.01	0.04	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.24	0.20	0.06	0.02	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW346_230905	0089_SW373_230905	0089_SW372_230905	0089_PW304_230905	0089_SW305_230905
				Sampling date / time	05-Sep-2023 11:04	05-Sep-2023 11:05	05-Sep-2023 11:06	05-Sep-2023 11:56	05-Sep-2023 11:56
Compound	CAS Number	LOR	Unit		EP2312178-001	EP2312178-002	EP2312178-003	EP2312178-004	EP2312178-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW346_230905	0089_SW373_230905	0089_SW372_230905	0089_PW304_230905	0089_SW305_230905
				Sampling date / time	05-Sep-2023 11:04	05-Sep-2023 11:05	05-Sep-2023 11:06	05-Sep-2023 11:56	05-Sep-2023 11:56
Compound	CAS Number	LOR	Unit		EP2312178-001	EP2312178-002	EP2312178-003	EP2312178-004	EP2312178-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.26**	**0.21**	**0.10**	**0.02**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.26**	**0.21**	**0.10**	**0.02**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.26**	**0.21**	**0.10**	**0.02**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**112**	**105**	**105**	**109**
13C8-PFOA	----	0.02	%		**101**	**105**	**98.0**	**100**	**101**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW368_230905	0089_SW371_230905	----	----	----
				Sampling date / time	05-Sep-2023 11:57	05-Sep-2023 11:58	----	----	----
Compound	CAS Number	LOR	Unit		EP2312178-006	EP2312178-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**225**	**143**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**225**	**143**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2380**	**2480**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18200**	**16600**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**442**	**414**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1360**	**1350**	----	----	----
Sodium	7440-23-5	1	mg/L		**10700**	**10800**	----	----	----
Potassium	7440-09-7	1	mg/L		**487**	**483**	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**567**	**523**	----	----	----
ø **Total Cations**	----	0.01	meq/L		**612**	**614**	----	----	----
ø **Ionic Balance**	----	0.01	%		**3.77**	**8.02**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.06**	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW368_230905	0089_SW371_230905	----	----	----
				Sampling date / time	05-Sep-2023 11:57	05-Sep-2023 11:58	----	----	----
Compound	CAS Number	LOR	Unit		EP2312178-006	EP2312178-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW368_230905	0089_SW371_230905	----	----	----
				Sampling date / time	05-Sep-2023 11:57	05-Sep-2023 11:58	----	----	----
Compound	CAS Number	LOR	Unit		EP2312178-006	EP2312178-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.06**	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.06**	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.06**	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**110**	----	----	----
13C8-PFOA	----	0.02	%		**100**	**101**	----	----	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2312178**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56898	Issue Date	: 15-Sep-2023
Sampler	: [redacted]		
Site	: Stirling SW/PW - ah		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Lab Technichian	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5287432)									
EP2312177-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	309	309	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	309	309	0.0	0% - 20%
EP2312183-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	608	613	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	608	613	0.7	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5281229)									
EP2312178-001	0089_PW346_230905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2430	2410	0.9	0% - 20%
EP2312187-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	----	----	----	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5281230)									
EP2312178-001	0089_PW346_230905	ED045G: Chloride	16887-00-6	1	mg/L	17800	18100	1.4	0% - 20%
EP2312187-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	----	----	----	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5283130)									
EP2312163-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EP2312170-009	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	85	86	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	16	16	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	50	50	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5284268)									
EP2312170-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	90	90	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	98	97	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1230	1230	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	63	64	0.0	0% - 20%
EP2312183-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	61	60	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	59	58	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	124	121	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5283094)									
EP2312183-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2312187-009	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	14.1	15.2	7.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	53.6	57.7	7.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.19	0.19	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.37	0.35	4.1	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.57	0.56	0.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5283094)									
EP2312183-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2312187-009	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.45	1.46	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.11	0.10	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.67	0.67	0.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.24	0.23	0.0	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	2.52	2.49	1.3	0% - 20%
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5283094) - continued									
EP2312187-009	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5283094)									
EP2312183-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2312187-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5283094)									
EP2312183-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5283094) - continued									
EP2312187-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5283094)									
EP2312183-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2312187-009	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	73.8	79.0	6.7	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	67.7	72.9	7.4	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	70.4	75.6	7.1	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5287432)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	98.2	91.2	110
				<1	200 mg/L	98.8	91.2	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281229)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.6	89.9	112
				<1	500 mg/L	94.7	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5281230)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	93.8	88.6	113
				<1	1000 mg/L	106	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5283130)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5284268)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283094)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	95.1	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	87.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	85.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283243)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	107	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283243) - continued								
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	113	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	97.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	103	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	91.5	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283094)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	86.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	92.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	85.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	83.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	94.8	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283243)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	101	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	106	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	98.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	116	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283094)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	80.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	76.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	79.9	60.5	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283094) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	101	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.9	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	84.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	77.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283243)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	95.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	101	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	107	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	121	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283094)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	92.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	93.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	94.2	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283243)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	99.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	106	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	103	64.2	133
EP231P: PFAS Sums (QCLot: 5283094)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5283243)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5283243) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281229)							
EP2312178-001	0089_PW346_230905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5281230)							
EP2312178-001	0089_PW346_230905	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283094)							
EP2312187-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	95.5	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	95.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	77.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	94.5	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	83.9	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	79.5	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283094)							
EP2312187-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.3	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	# Not Determined	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	89.5	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	93.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	103	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	99.2	65.0	144

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283094) - continued							
EP2312187-001	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283094)							
EP2312187-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	86.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	85.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	97.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	92.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	99.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283094)							
EP2312187-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	97.0	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	64.5	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	98.1	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.6	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312178**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: Stirling SW/PW - ah	Issue Date	: 15-Sep-2023
Sampler	: [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2312178--001	0089_PW346_230905	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2312178--001	0089_PW346_230905	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2312187--001	Anonymous	**Perfluoropentanoic acid (PFPeA)**	2706-90-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2312187--001	Anonymous	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2312187--001	Anonymous	**Perfluoroheptanoic acid (PFHpA)**	375-85-9	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_PW346_230905, 0089_SW372_230905	0089_SW373_230905,	----	----	----	13-Sep-2023	12-Sep-2023	**1**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
	2				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	28	7.14	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	28	3.57	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW346_230905, 0089_SW372_230905, 0089_SW305_230905, 0089_SW371_230905, 0089_SW373_230905, 0089_PW304_230905, 0089_PW368_230905,	**05-Sep-2023**	**----**	----	**----**	**09-Sep-2023**	19-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW346_230905, 0089_SW372_230905, 0089_SW305_230905, 0089_SW371_230905, 0089_SW373_230905, 0089_PW304_230905, 0089_PW368_230905,	**05-Sep-2023**	**----**	----	**----**	**15-Sep-2023**	03-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW346_230905, 0089_SW372_230905, 0089_SW305_230905, 0089_SW371_230905, 0089_SW373_230905, 0089_PW304_230905, 0089_PW368_230905,	**05-Sep-2023**	**----**	----	**----**	**15-Sep-2023**	03-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW346_230905, 0089_SW372_230905, 0089_SW373_230905,	**05-Sep-2023**	**----**	----	**----**	**13-Sep-2023**	12-Sep-2023	×
Clear Plastic Bottle - Natural (ED093F)							
0089_PW304_230905, 0089_PW368_230905, 0089_SW305_230905, 0089_SW371_230905,	**05-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	12-Sep-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW346_230905, 0089_SW372_230905, 0089_SW305_230905, 0089_SW371_230905, 0089_SW373_230905, 0089_PW304_230905, 0089_PW368_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW346_230905, 0089_SW372_230905, 0089_SW305_230905, 0089_SW371_230905, 0089_SW373_230905, 0089_PW304_230905, 0089_PW368_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW346_230905, 0089_SW372_230905, 0089_SW305_230905, 0089_SW371_230905, 0089_SW373_230905, 0089_PW304_230905, 0089_PW368_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW346_230905, 0089_SW372_230905, 0089_SW305_230905, 0089_SW371_230905, 0089_SW373_230905, 0089_PW304_230905, 0089_PW368_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW346_230905, 0089_SW372_230905, 0089_SW305_230905, 0089_SW371_230905, 0089_SW373_230905, 0089_PW304_230905, 0089_PW368_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	28	**7.14**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	28	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	28	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	28	**3.57**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2312180

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 Client: Stantec Project Manager: [redacted]

Phone: ( )

ALS Compass COC Reference: 56858 # Samples: 56898 56905 56870 56871 56902 56903 56863, 56862, 56859, 56864, 56856

Sampler: [redacted]

Phone: ( )

Turnaround Requirements: (Standard) Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 05/09/2023	Date / Time: 6/9 1030	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 56905 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 6/9 1030	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD304		05/09/2023 11:53 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD346		05/09/2023 11:53 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD368		05/09/2023 11:59 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 56905 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD304	HDPE Soil Jar	200 mL	00621122090662	Grey	No	
002	0089_SD346	HDPE Soil Jar	200 mL	00621122090716	Grey	No	
003	0089_SD368	HDPE Soil Jar	200 mL	00621122084026	Grey	No	

Total Bottle Count: ALS: 3, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312180**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 56905	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - ah		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 06-Sep-2023 10:30	Issue Date	: 06-Sep-2023
Client Requested Due Date	: 15-Sep-2023	Scheduled Reporting Date	: **14-Sep-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 10.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2312180-001	05-Sep-2023 11:53	0089_SD304_230905	✓	✓
EP2312180-002	05-Sep-2023 11:53	0089_SD346_230905	✓	✓
EP2312180-003	05-Sep-2023 11:59	0089_SD368_230905	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312180**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: 56905	Issue Date	: 14-Sep-2023 14:00
Sampler	: [redacted]		
Site	: Stirling SD - ah		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD304_230905	0089_SD346_230905	0089_SD368_230905	----	----
			Sampling date / time	05-Sep-2023 11:53	05-Sep-2023 11:53	05-Sep-2023 11:59	----	----
Compound	CAS Number	LOR	Unit	EP2312180-001	EP2312180-002	EP2312180-003	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**29.5**	**29.5**	**33.4**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	**0.0013**	**0.0003**	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD304_230905	0089_SD346_230905	0089_SD368_230905	----	----
				Sampling date / time	05-Sep-2023 11:53	05-Sep-2023 11:53	05-Sep-2023 11:59	----	----
Compound	CAS Number	LOR	Unit		EP2312180-001	EP2312180-002	EP2312180-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	**0.0013**	**0.0003**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	**0.0013**	**0.0003**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	**0.0013**	**0.0003**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**102**	**110**	**102**	----	----
13C8-PFOA	----	0.0002	%		**99.5**	**98.5**	**93.5**	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2312180**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: 56905	Issue Date	: 14-Sep-2023
Sampler	: [redacted]		
Site	: Stirling SD - ah		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5292627)									
EP2312171-001	Anonymous	EA055: Moisture Content	----	0.1	%	26.0	26.9	3.5	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5281119)									
EP2312171-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2312180-003	0089_SD368_230905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5281119)									
EP2312171-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5281119) - continued									
EP2312171-001	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2312180-003	0089_SD368_230905	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5281119)									
EP2312171-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312180-003	0089_SD368_230905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5281119)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5281119) - continued									
EP2312171-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312180-003	0089_SD368_230905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5281119)									
EP2312171-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2312180-003	0089_SD368_230905	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5281119)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	116	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	91.5	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	104	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	96.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5281119)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	106	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	110	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5281119)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.7	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281119)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281119) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	103	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	102	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	118	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	98.3	54.8	124
EP231P: PFAS Sums (QCLot: 5281119)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5281119)							
EP2312171-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	120	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	113	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	104	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	109	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	105	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	111	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5281119)							
EP2312171-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	105	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	97.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	101	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	105	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	114	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	105	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	111	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	113	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	122	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	106	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5281119)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5281119) - continued							
EP2312171-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	95.6	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	114	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	123	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	114	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	116	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	118	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281119)							
EP2312171-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	106	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	109	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	102	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312180**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: Stirling SD - ah	Issue Date	: 14-Sep-2023
Sampler	: [redacted]	No. of samples received	: 3
Order number	: pfas-omp/Stirling	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD304_230905, 0089_SD346_230905, 0089_SD368_230905	**05-Sep-2023**	**----**	----	----	**12-Sep-2023**	19-Sep-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD304_230905, 0089_SD346_230905, 0089_SD368_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD304_230905, 0089_SD346_230905, 0089_SD368_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD304_230905, 0089_SD346_230905, 0089_SD368_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD304_230905, 0089_SD346_230905, 0089_SD368_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD304_230905, 0089_SD346_230905, 0089_SD368_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
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ALS

Environmental Division
Perth
Work Order Reference
EP2312183

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

Phone: ( )

ALS Compass COC Reference: 56858 ~~56861~~, 56863, 56862, 56859, 56864, 56856 **# Samples:** 56898 56905 56870 56871 56902 56903 **Sampler:** [redacted]

Phone: ( )

Turnaround Requirements: (Standard) _____ Urgent _____

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 05/09/2023	Date / Time: 6/9 1030	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 56856 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW124		05/09/2023 09:12 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_MW127		05/09/2023 10:02 AM	WATER	ALS: 5 Non ALS: 0	No	X		
003	0089_MW126		05/09/2023 10:30 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW125		05/09/2023 11:27 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW203		05/09/2023 12:02 PM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 56856 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW124	Clear Plastic Bottle - Natural	125 mL	00070522068946	Green	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350822007783	Grey	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350822007807	Grey	No	
002	0089_MW127	Clear Plastic Bottle - Natural	125 mL	00070522068826	Green	No	
002	0089_MW127	HDPE (no PTFE)	20 mL	00350822007923	Grey	No	
002	0089_MW127	HDPE (no PTFE)	20 mL	00350822008004	Grey	No	
002	0089_MW127	HDPE (no PTFE)	20 mL	00351221005809	Grey	No	
002	0089_MW127	HDPE (no PTFE)	20 mL	00351221005750	Grey	No	
003	0089_MW126	HDPE (no PTFE)	20 mL	00351221005707	Grey	No	
003	0089_MW126	Clear Plastic Bottle - Natural	125 mL	00070522068762	Green	No	
003	0089_MW126	HDPE (no PTFE)	20 mL	00351221006090	Grey	No	
004	0089_MW125	Clear Plastic Bottle - Natural	125 mL	00070522068852	Green	No	
004	0089_MW125	HDPE (no PTFE)	20 mL	00350822007849	Grey	No	
004	0089_MW125	HDPE (no PTFE)	20 mL	00350822008028	Grey	No	
005	0089_MW203	HDPE (no PTFE)	20 mL	00350822007981	Grey	No	
005	0089_MW203	HDPE (no PTFE)	20 mL	00350822007868	Grey	No	
005	0089_MW203	Clear Plastic Bottle - Natural	125 mL	00070522068860	Green	No	
005	0089_MW203	HDPE (no PTFE)	20 mL	00351221005891	Grey	No	
005	0089_MW203	HDPE (no PTFE)	20 mL	00351221005821	Grey	No	

Total Bottle Count: ALS: 19, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312183**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 56856	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2023 10:30	Issue Date	: 06-Sep-2023
Client Requested Due Date	: 15-Sep-2023	Scheduled Reporting Date	: **15-Sep-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 10.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2312183-001	05-Sep-2023 09:12	0089_MW124_230905	✓	✓
EP2312183-002	05-Sep-2023 10:02	0089_MW127_230905	✓	✓
EP2312183-003	05-Sep-2023 10:30	0089_MW126_230905	✓	✓
EP2312183-004	05-Sep-2023 11:27	0089_MW125_230905	✓	✓
EP2312183-005	05-Sep-2023 12:02	0089_MW203_230905	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312183**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56856	Issue Date	: 15-Sep-2023 15:04
Sampler	: [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW124_230905	0089_MW127_230905	0089_MW126_230905	0089_MW125_230905	0089_MW203_230905
				Sampling date / time	05-Sep-2023 09:12	05-Sep-2023 10:02	05-Sep-2023 10:30	05-Sep-2023 11:27	05-Sep-2023 12:02
Compound	CAS Number	LOR	Unit		EP2312183-001	EP2312183-002	EP2312183-003	EP2312183-004	EP2312183-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		381	608	506	416	331
Total Alkalinity as CaCO3	----	1	mg/L		381	608	506	416	331
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		1790	1640	1040	1850	191
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		13800	13400	7080	13200	174
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		452	392	247	433	61
Magnesium	7439-95-4	1	mg/L		1160	1130	557	1120	59
Sodium	7440-23-5	1	mg/L		8990	7590	3520	8040	124
Potassium	7440-09-7	1	mg/L		430	359	182	393	13
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		434	424	231	419	15.5
ø Total Cations	----	0.01	meq/L		520	452	216	474	13.6
ø Ionic Balance	----	0.01	%		9.00	3.15	3.47	6.09	6.43
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	0.10	0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	0.10	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	0.38	0.03
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	0.02	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	0.12	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW124_230905	0089_MW127_230905	0089_MW126_230905	0089_MW125_230905	0089_MW203_230905
				Sampling date / time	05-Sep-2023 09:12	05-Sep-2023 10:02	05-Sep-2023 10:30	05-Sep-2023 11:27	05-Sep-2023 12:02
Compound	CAS Number	LOR	Unit		EP2312183-001	EP2312183-002	EP2312183-003	EP2312183-004	EP2312183-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW124_230905	0089_MW127_230905	0089_MW126_230905	0089_MW125_230905	0089_MW203_230905
				Sampling date / time	05-Sep-2023 09:12	05-Sep-2023 10:02	05-Sep-2023 10:30	05-Sep-2023 11:27	05-Sep-2023 12:02
Compound	CAS Number	LOR	Unit		EP2312183-001	EP2312183-002	EP2312183-003	EP2312183-004	EP2312183-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.72**	**0.05**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.40**	**0.03**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.62**	**0.05**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**108**	**116**	**103**	**106**	**107**
13C8-PFOA	----	0.02	%		**102**	**103**	**102**	**108**	**101**

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	***Low***	***High***
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2312183**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56856	Issue Date	: 15-Sep-2023
Sampler	: [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5287432)									
EP2312177-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	309	309	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	309	309	0.0	0% - 20%
EP2312183-002	0089_MW127_230905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	608	613	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	608	613	0.7	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5281227)									
EP2312172-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2390	2380	0.4	0% - 20%
EP2312184-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2460	2480	0.5	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5281228)									
EP2312172-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18500	19400	4.8	0% - 20%
EP2312184-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18500	19800	6.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5283125)									
EP2312161-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EP2312184-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	469	460	1.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1520	1500	1.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	11700	1.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	577	565	2.1	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5283130)									
EP2312163-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EP2312170-009	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	85	86	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	16	16	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	50	50	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5283131)									
EP2312183-003	0089_MW126_230905	ED093F: Calcium	7440-70-2	1	mg/L	247	256	3.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	557	574	2.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3520	3620	2.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	182	187	3.0	0% - 20%
EP2312188-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	427	445	4.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1430	3.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10800	11200	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	540	561	3.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5284268)									
EP2312170-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	90	90	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	98	97	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1230	1230	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	63	64	0.0	0% - 20%
EP2312183-005	0089_MW203_230905	ED093F: Calcium	7440-70-2	1	mg/L	61	60	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	59	58	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	124	121	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5283025)									
EP2312183-005	0089_MW203_230905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5283094)									
EP2312183-002	0089_MW127_230905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5283094) - continued									
EP2312183-002	0089_MW127_230905	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2312187-009	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	14.1	15.2	7.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	53.6	57.7	7.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.19	0.19	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.37	0.35	4.1	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.57	0.56	0.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5283025)									
EP2312183-005	0089_MW203_230905	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5283094)									
EP2312183-002	0089_MW127_230905	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2312187-009	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.45	1.46	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.11	0.10	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.67	0.67	0.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.24	0.23	0.0	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	2.52	2.49	1.3	0% - 20%
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5283094) - continued									
EP2312187-009	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5283025)									
EP2312183-005	0089_MW203_230905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5283094)									
EP2312183-002	0089_MW127_230905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2312187-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5283094) - continued									
EP2312187-009	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5283025)									
EP2312183-005	0089_MW203_230905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5283094)									
EP2312183-002	0089_MW127_230905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2312187-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5283025)									
EP2312183-005	0089_MW203_230905	EP231X: Sum of PFAS	----	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.05	0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5283094)									
EP2312183-002	0089_MW127_230905	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2312187-009	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	73.8	79.0	6.7	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5283094) - continued									
EP2312187-009	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	67.7	72.9	7.4	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	70.4	75.6	7.1	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5287432)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	98.2	91.2	110
				<1	200 mg/L	98.8	91.2	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281227)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.9	89.9	112
				<1	500 mg/L	101	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5281228)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.0	88.6	113
				<1	1000 mg/L	94.1	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5283125)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.4	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	94.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.8	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5283130)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5283131)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.3	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5284268)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.8	91.4	113

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 5284268) - continued								
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283025)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	112	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	106	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	114	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	130	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	106	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	108	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283094)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	95.1	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	87.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	85.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283025)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	108	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	109	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	110	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	108	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	121	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	115	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	120	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	113	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283094)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	86.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	92.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	85.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.0	69.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283094) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	83.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	94.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283025)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	114	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	124	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	116	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	113	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	95.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283094)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	80.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	76.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	79.9	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	101	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.9	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	84.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	77.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283025)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	120	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	117	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	117	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283094)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	92.2	63.0	143

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283094) - continued								
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	93.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	94.2	64.2	133
EP231P: PFAS Sums (QCLot: 5283025)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5283094)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281227)							
EP2312172-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5281228)							
EP2312172-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283025)							
EP2312187-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	112	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	120	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	126	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	109	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	109	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283094)							
EP2312187-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	95.5	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	95.4	71.0	127

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283094) - continued							
EP2312187-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	77.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	94.5	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	83.9	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	79.5	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283025)							
EP2312187-005	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	101	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	121	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	108	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	110	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	103	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	102	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	113	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	107	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	118	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	126	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	114	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283094)							
EP2312187-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.3	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	# Not Determined	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	89.5	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	93.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	103	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	99.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283025)							
EP2312187-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	111	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	102	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	98.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	114	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283025) - continued							
EP2312187-005	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	120	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	120	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	119	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283094)							
EP2312187-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	86.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	85.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	97.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	92.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	99.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283025)							
EP2312187-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	117	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	105	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	107	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283094)							
EP2312187-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	97.0	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	64.5	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	98.1	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.6	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312183**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: Stirling GW - JS	Issue Date	: 15-Sep-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 5
Order number	: pfas-omp/Stirling	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2312172--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2312172--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2312187--001	Anonymous	**Perfluoropentanoic acid (PFPeA)**	2706-90-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2312187--001	Anonymous	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2312187--001	Anonymous	**Perfluoroheptanoic acid (PFHpA)**	375-85-9	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_MW124_230905,	0089_MW127_230905,	----	----	----	13-Sep-2023	12-Sep-2023	**1**
0089_MW126_230905,	0089_MW125_230905						

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW124_230905, 0089_MW127_230905, 0089_MW126_230905, 0089_MW125_230905, 0089_MW203_230905	**05-Sep-2023**	**----**	----	----	**09-Sep-2023**	19-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW124_230905, 0089_MW127_230905, 0089_MW126_230905, 0089_MW125_230905, 0089_MW203_230905	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	03-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW124_230905, 0089_MW127_230905, 0089_MW126_230905, 0089_MW125_230905, 0089_MW203_230905	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	03-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW124_230905, 0089_MW127_230905, 0089_MW126_230905, 0089_MW125_230905	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	12-Sep-2023	×
Clear Plastic Bottle - Natural (ED093F)							
0089_MW203_230905	**05-Sep-2023**	**----**	----	----	**12-Sep-2023**	12-Sep-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW125_230905, 0089_MW203_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**07-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW124_230905, 0089_MW127_230905, 0089_MW126_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW125_230905, 0089_MW203_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**07-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW124_230905, 0089_MW127_230905, 0089_MW126_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW125_230905, 0089_MW203_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**07-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW124_230905, 0089_MW127_230905, 0089_MW126_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_MW125_230905, 0089_MW203_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**07-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW124_230905, 0089_MW127_230905, 0089_MW126_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_MW125_230905, 0089_MW203_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**07-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW124_230905, 0089_MW127_230905, 0089_MW126_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	8	64	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	20	**15.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	64	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	64	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2312184

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23

Client: Stantec

Project Manager: [redacted]

Phone:

ALS Compass COC Reference: ~~56861~~, 56863, 56862, 56859, 56864, 56856, 56858

Samples: 56898 56905 56870 56871 56902 56903

Sampler: [redacted]

Phone:

Turnaround Requirements: (Standard) Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 05/09/2023	Date / Time: 6/9 1030	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 56862 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_QC112		05/09/2023 09:23 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_SW408	Lab QC added	05/09/2023 09:23 AM	WATER	ALS: 5 Non ALS: 0	No	X		
003	0089_SW406		05/09/2023 09:24 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW405	Lab	05/09/2023 10:14 AM	WATER	ALS: 5 Non ALS: 0	No	X		
005	0089_PW407		05/09/2023 09:27 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_PW380		05/09/2023 03:21 PM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW401		05/09/2023 03:21 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 56862 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_PW351		05/09/2023 03:22 PM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_PW381		05/09/2023 03:23 PM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_PW350		05/09/2023 03:23 PM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_SW384		05/09/2023 03:24 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 56862 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_QC112	Clear Plastic Bottle - Natural	125 mL	00070522068846	Green	No	
001	0089_QC112	HDPE (no PTFE)	20 mL	00350822007986	Grey	No	
001	0089_QC112	HDPE (no PTFE)	20 mL	00350822007974	Grey	No	
002	0089_SW408	Clear Plastic Bottle - Natural	125 mL	00070522068772	Green	No	
002	0089_SW408	HDPE (no PTFE)	20 mL	00350822007928	Grey	No	
002	0089_SW408	HDPE (no PTFE)	20 mL	00350822007781	Grey	No	
002	0089_SW408	HDPE (no PTFE)	20 mL	00351221005717	Grey	No	
002	0089_SW408	HDPE (no PTFE)	20 mL	00351221005840	Grey	No	
003	0089_SW406	Clear Plastic Bottle - Natural	125 mL	00070522068761	Green	No	
003	0089_SW406	HDPE (no PTFE)	20 mL	00350822008026	Grey	No	
003	0089_SW406	HDPE (no PTFE)	20 mL	00350822007764	Grey	No	
004	0089_PW405	Clear Plastic Bottle - Natural	125 mL	00070522068820	Green	No	
004	0089_PW405	HDPE (no PTFE)	20 mL	00350822007776	Grey	No	
004	0089_PW405	HDPE (no PTFE)	20 mL	00350822007861	Grey	No	
004	0089_PW405	HDPE (no PTFE)	20 mL	00351221006218	Grey	No	
004	0089_PW405	HDPE (no PTFE)	20 mL	00351221006006	Grey	No	
005	0089_PW407	HDPE (no PTFE)	20 mL	00350822064025	Grey	No	
005	0089_PW407	HDPE (no PTFE)	20 mL	00350822008024	Grey	No	
005	0089_PW407	Clear Plastic Bottle - Natural	125 mL	00070522068927	Green	No	
006	0089_PW380	Clear Plastic Bottle - Natural	125 mL	00070522068729	Green	No	
006	0089_PW380	HDPE (no PTFE)	20 mL	00351221006032	Grey	No	
006	0089_PW380	HDPE (no PTFE)	20 mL	00351221005787	Grey	No	
007	0089_PW401	Clear Plastic Bottle - Natural	125 mL	00070522068840	Green	No	
007	0089_PW401	HDPE (no PTFE)	20 mL	00350822008003	Grey	No	
007	0089_PW401	HDPE (no PTFE)	20 mL	00350822007839	Grey	No	
008	0089_PW351	HDPE (no PTFE)	20 mL	00351221006007	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 56862 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_PW351	Clear Plastic Bottle - Natural	125 mL	00070522068866	Green	No	
008	0089_PW351	HDPE (no PTFE)	20 mL	00351221006266	Grey	No	
009	0089_PW381	Clear Plastic Bottle - Natural	125 mL	00070522068833	Green	No	
009	0089_PW381	HDPE (no PTFE)	20 mL	00350822007921	Grey	No	
009	0089_PW381	HDPE (no PTFE)	20 mL	00350822007926	Grey	No	
010	0089_PW350	Clear Plastic Bottle - Natural	125 mL	00070522068786	Green	No	
010	0089_PW350	HDPE (no PTFE)	20 mL	00350822007917	Grey	No	
010	0089_PW350	HDPE (no PTFE)	20 mL	00350822008001	Grey	No	
011	0089_SW384	Clear Plastic Bottle - Natural	125 mL	00070522068771	Green	No	
011	0089_SW384	HDPE (no PTFE)	20 mL	00351221005998	Grey	No	
011	0089_SW384	HDPE (no PTFE)	20 mL	00351221006107	Grey	No	

Total Bottle Count: ALS: 37, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312184**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 56862	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - SC		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2023 10:30	Issue Date	: 06-Sep-2023
Client Requested Due Date	: 15-Sep-2023	Scheduled Reporting Date	: **15-Sep-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 10.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EP2312184-002 : 05-Sep-2023 09:23 : 0089_SW408_230905 - Lab QC added
EP2312184-004 : 05-Sep-2023 10:14 : 0089_PW405_230905 - Lab

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2312184-001	05-Sep-2023 09:23	0089_QC112_230905	✓	✓
EP2312184-002	05-Sep-2023 09:23	0089_SW408_230905 L...	✓	✓
EP2312184-003	05-Sep-2023 09:24	0089_SW406_230905	✓	✓
EP2312184-004	05-Sep-2023 10:14	0089_PW405_230905 L...	✓	✓
EP2312184-005	05-Sep-2023 09:27	0089_PW407_230905	✓	✓
EP2312184-006	05-Sep-2023 15:21	0089_PW380_230905	✓	✓
EP2312184-007	05-Sep-2023 15:21	0089_PW401_230905	✓	✓
EP2312184-008	05-Sep-2023 15:22	0089_PW351_230905	✓	✓
EP2312184-009	05-Sep-2023 15:23	0089_PW381_230905	✓	✓
EP2312184-010	05-Sep-2023 15:23	0089_PW350_230905	✓	✓
EP2312184-011	05-Sep-2023 15:24	0089_SW384_230905	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312184**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56862	Issue Date	: 15-Sep-2023 15:11
Sampler	: [redacted]		
Site	: Stirling SW/PW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Lab Technichian	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC112_230905	0089_SW408_230905 Lab QC added	0089_SW406_230905	0089_PW405_230905 Lab	0089_PW407_230905
				Sampling date / time	05-Sep-2023 09:23	05-Sep-2023 09:23	05-Sep-2023 09:24	05-Sep-2023 10:14	05-Sep-2023 09:27
					EP2312184-001	EP2312184-002	EP2312184-003	EP2312184-004	EP2312184-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**132**	**132**	**133**	**133**	**133**
Total Alkalinity as CaCO3	----	1	mg/L		**132**	**132**	**133**	**133**	**133**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2520**	**2460**	**2540**	**2520**	**2420**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19000**	**18500**	**18400**	**18800**	**18600**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**469**	**444**	**447**	**441**	**443**
Magnesium	7439-95-4	1	mg/L		**1520**	**1430**	**1450**	**1430**	**1440**
Sodium	7440-23-5	1	mg/L		**12000**	**11200**	**11300**	**11200**	**11200**
Potassium	7440-09-7	1	mg/L		**577**	**543**	**548**	**560**	**561**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**591**	**576**	**574**	**585**	**578**
ø Total Cations	----	0.01	meq/L		**685**	**641**	**647**	**641**	**642**
ø Ionic Balance	----	0.01	%		**7.38**	**5.36**	**5.94**	**4.54**	**5.28**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC112_230905	0089_SW408_230905 Lab QC added	0089_SW406_230905	0089_PW405_230905 Lab	0089_PW407_230905
				Sampling date / time	05-Sep-2023 09:23	05-Sep-2023 09:23	05-Sep-2023 09:24	05-Sep-2023 10:14	05-Sep-2023 09:27
Compound	CAS Number	LOR	Unit		EP2312184-001	EP2312184-002	EP2312184-003	EP2312184-004	EP2312184-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC112_230905	0089_SW408_230905 Lab QC added	0089_SW406_230905	0089_PW405_230905 Lab	0089_PW407_230905
				Sampling date / time	05-Sep-2023 09:23	05-Sep-2023 09:23	05-Sep-2023 09:24	05-Sep-2023 10:14	05-Sep-2023 09:27
Compound	CAS Number	LOR	Unit		EP2312184-001	EP2312184-002	EP2312184-003	EP2312184-004	EP2312184-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**102**	**96.0**	**107**	**99.0**
13C8-PFOA	----	0.02	%		**90.7**	**93.6**	**89.5**	**88.5**	**91.5**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW380_230905	0089_PW401_230905	0089_PW351_230905	0089_PW381_230905	0089_PW350_230905
				Sampling date / time	05-Sep-2023 15:21	05-Sep-2023 15:21	05-Sep-2023 15:22	05-Sep-2023 15:23	05-Sep-2023 15:23
Compound	CAS Number	LOR	Unit		EP2312184-006	EP2312184-007	EP2312184-008	EP2312184-009	EP2312184-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		130	126	125	128	125
Total Alkalinity as CaCO3	----	1	mg/L		130	126	125	128	125
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2500	2560	2510	2500	2530
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19600	19300	18300	19300	19000
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		425	427	428	431	436
Magnesium	7439-95-4	1	mg/L		1400	1420	1410	1410	1430
Sodium	7440-23-5	1	mg/L		11200	11300	11200	11200	11400
Potassium	7440-09-7	1	mg/L		500	506	504	502	510
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		608	600	571	599	591
ø Total Cations	----	0.01	meq/L		636	643	637	638	648
ø Ionic Balance	----	0.01	%		2.32	3.41	5.50	3.12	4.62
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW380_230905	0089_PW401_230905	0089_PW351_230905	0089_PW381_230905	0089_PW350_230905
				Sampling date / time	05-Sep-2023 15:21	05-Sep-2023 15:21	05-Sep-2023 15:22	05-Sep-2023 15:23	05-Sep-2023 15:23
Compound	CAS Number	LOR	Unit		EP2312184-006	EP2312184-007	EP2312184-008	EP2312184-009	EP2312184-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW380_230905	0089_PW401_230905	0089_PW351_230905	0089_PW381_230905	0089_PW350_230905
				Sampling date / time	05-Sep-2023 15:21	05-Sep-2023 15:21	05-Sep-2023 15:22	05-Sep-2023 15:23	05-Sep-2023 15:23
Compound	CAS Number	LOR	Unit		EP2312184-006	EP2312184-007	EP2312184-008	EP2312184-009	EP2312184-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**92.9**	**100**	**107**	**109**
13C8-PFOA	----	0.02	%		**87.9**	**95.2**	**93.3**	**85.7**	**87.1**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW384_230905	----	----	----	----
				Sampling date / time	05-Sep-2023 15:24	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312184-011	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**125**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**125**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2440**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20300**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**434**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1430**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**11400**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**508**	----	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**626**	----	----	----	----
ø **Total Cations**	----	0.01	meq/L		**648**	----	----	----	----
ø **Ionic Balance**	----	0.01	%		**1.75**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW384_230905	----	----	----	----
				Sampling date / time	05-Sep-2023 15:24	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312184-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW384_230905	----	----	----	----
				Sampling date / time	05-Sep-2023 15:24	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312184-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	----	----	----	----
13C8-PFOA	----	0.02	%		**84.0**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2312184**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56862	Issue Date	: 15-Sep-2023
Sampler	: [redacted]		
Site	: Stirling SW/PW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Lab Technichian	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5287432)									
EP2312177-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	309	309	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	309	309	0.0	0% - 20%
EP2312183-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	608	613	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	608	613	0.7	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5292131)									
EP2312184-007	0089_PW401_230905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	126	125	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	126	125	1.0	0% - 20%
EP2312187-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	325	325	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	325	325	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5281227)									
EP2312172-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2390	2380	0.4	0% - 20%
EP2312184-002	0089_SW408_230905 Lab QC added	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2460	2480	0.5	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5281228)									
EP2312172-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18500	19400	4.8	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 5281228) - continued									
EP2312184-002	0089_SW408_230905 Lab QC added	ED045G: Chloride	16887-00-6	1	mg/L	18500	19800	6.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5283125)									
EP2312161-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EP2312184-001	0089_QC112_230905	ED093F: Calcium	7440-70-2	1	mg/L	469	460	1.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1520	1500	1.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	11700	1.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	577	565	2.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5283131)									
EP2312183-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	247	256	3.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	557	574	2.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3520	3620	2.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	182	187	3.0	0% - 20%
EP2312188-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	427	445	4.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1430	3.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10800	11200	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	540	561	3.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5284268)									
EP2312170-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	90	90	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	98	97	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1230	1230	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	63	64	0.0	0% - 20%
EP2312183-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	61	60	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	59	58	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	124	121	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5283791)									
EP2312188-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5285887)									
EP2312184-002	0089_SW408_230905 Lab QC added	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5285887) - continued									
EP2312184-002	0089_SW408_230905 Lab QC added	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5283791)									
EP2312188-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5285887)									
EP2312184-002	0089_SW408_230905 Lab QC added	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5283791)									
EP2312188-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5283791) - continued									
EP2312188-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5285887)									
EP2312184-002	0089_SW408_230905 Lab QC added	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5283791)									
EP2312188-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5285887)									
EP2312184-002	0089_SW408_230905 Lab QC added	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5283791)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5283791) - continued									
EP2312188-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5285887)									
EP2312184-002	0089_SW408_230905 Lab QC added	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5287432)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	98.2	91.2	110
				<1	200 mg/L	98.8	91.2	110
ED037P: Alkalinity by PC Titrator (QCLot: 5292131)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	85.1	126
				<1	200 mg/L	102	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281227)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.9	89.9	112
				<1	500 mg/L	101	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5281228)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.0	88.6	113
				<1	1000 mg/L	94.1	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5283125)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.4	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	94.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.8	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5283131)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.3	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5284268)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED093F: Dissolved Major Cations (QCLot: 5284268) - continued								
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283791)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	91.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	82.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	77.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	85.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	86.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	85.9	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5285887)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	88.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	80.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	83.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	79.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	81.3	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283791)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.9	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	77.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	86.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	77.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	82.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	79.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	93.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5285887)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	83.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	81.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5285887) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	85.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	89.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	83.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	93.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283791)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	76.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	73.5	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	82.1	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	87.2	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	85.5	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	89.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5285887)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	77.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	77.5	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.1	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	84.2	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	93.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	71.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283791)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	86.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	89.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	103	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	91.3	64.2	133

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5285887)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	82.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	83.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	92.7	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	77.4	64.2	133
EP231P: PFAS Sums (QCLot: 5283791)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5285887)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281227)							
EP2312172-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5281228)							
EP2312172-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283791)							
EP2312188-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.0	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	84.1	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	79.1	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	86.3	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	87.7	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	73.7	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5285887)							
EP2312188-011	Anonymous						

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5285887) - continued							
EP2312188-011	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	89.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	86.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	80.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	83.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	87.1	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	84.0	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283791)							
EP2312188-004	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	93.6	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	79.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	85.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	84.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.3	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	90.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	82.2	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	88.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	85.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	87.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	94.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5285887)							
EP2312188-011	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	81.2	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	85.4	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	81.2	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	83.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	81.6	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	83.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	87.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	86.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	86.8	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	84.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	90.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283791)							
EP2312188-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	76.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	78.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	81.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	102	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283791) - continued							
EP2312188-004	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	89.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	96.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	79.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5285887)							
EP2312188-011	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	72.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	82.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	88.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	94.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	87.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	86.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	75.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283791)							
EP2312188-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	92.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	89.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	85.5	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5285887)							
EP2312188-011	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	80.3	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	76.3	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	84.2	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	79.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312184**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: Stirling SW/PW - SC	Issue Date	: 15-Sep-2023
Sampler	: [redacted]	No. of samples received	: 11
Order number	: pfas-omp/Stirling	No. of samples analysed	: 11

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2312172--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2312172--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_QC112_230905, 0089_SW406_230905, 0089_PW407_230905	0089_SW408_230905 - Lab QC added, 0089_PW405_230905 - Lab,	----	----	----	13-Sep-2023	12-Sep-2023	**1**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
	2				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	27	7.41	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_QC112_230905,	0089_SW408_230905 - Lab QC added,	**05-Sep-2023**	----	----	----	**09-Sep-2023**	19-Sep-2023	✓
0089_SW406_230905,	0089_PW405_230905 - Lab,							
0089_PW407_230905,	0089_PW380_230905							
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW401_230905,	0089_PW351_230905,	**05-Sep-2023**	----	----	----	**13-Sep-2023**	19-Sep-2023	✓
0089_PW381_230905,	0089_PW350_230905,							
0089_SW384_230905								
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_QC112_230905,	0089_SW408_230905 - Lab QC added,	**05-Sep-2023**	----	----	----	**15-Sep-2023**	03-Oct-2023	✓
0089_SW406_230905,	0089_PW405_230905 - Lab,							
0089_PW407_230905,	0089_PW380_230905,							
0089_PW401_230905,	0089_PW351_230905,							
0089_PW381_230905,	0089_PW350_230905,							
0089_SW384_230905								
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_QC112_230905,	0089_SW408_230905 - Lab QC added,	**05-Sep-2023**	----	----	----	**15-Sep-2023**	03-Oct-2023	✓
0089_SW406_230905,	0089_PW405_230905 - Lab,							
0089_PW407_230905,	0089_PW380_230905,							
0089_PW401_230905,	0089_PW351_230905,							
0089_PW381_230905,	0089_PW350_230905,							
0089_SW384_230905								
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_QC112_230905,	0089_SW408_230905 - Lab QC added,	**05-Sep-2023**	----	----	----	**13-Sep-2023**	12-Sep-2023	×
0089_SW406_230905,	0089_PW405_230905 - Lab,							
0089_PW407_230905								
Clear Plastic Bottle - Natural (ED093F)								
0089_PW380_230905,	0089_PW401_230905,	**05-Sep-2023**	----	----	----	**12-Sep-2023**	12-Sep-2023	✓
0089_PW351_230905,	0089_PW381_230905,							
0089_PW350_230905,	0089_SW384_230905							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW408_230905 - Lab QC added,	0089_SW406_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_PW407_230905,	0089_PW401_230905,							
0089_PW351_230905								
HDPE (no PTFE) (EP231X)								
0089_QC112_230905,	0089_PW405_230905 - Lab,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	03-Mar-2024	✓
0089_PW380_230905,	0089_PW381_230905,							
0089_PW350_230905,	0089_SW384_230905							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW408_230905 - Lab QC added,	0089_SW406_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_PW407_230905,	0089_PW401_230905,							
0089_PW351_230905								
HDPE (no PTFE) (EP231X)								
0089_QC112_230905,	0089_PW405_230905 - Lab,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	03-Mar-2024	✓
0089_PW380_230905,	0089_PW381_230905,							
0089_PW350_230905,	0089_SW384_230905							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_SW408_230905 - Lab QC added,	0089_SW406_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_PW407_230905,	0089_PW401_230905,							
0089_PW351_230905								
HDPE (no PTFE) (EP231X)								
0089_QC112_230905,	0089_PW405_230905 - Lab,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	03-Mar-2024	✓
0089_PW380_230905,	0089_PW381_230905,							
0089_PW350_230905,	0089_SW384_230905							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW408_230905 - Lab QC added,	0089_SW406_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_PW407_230905,	0089_PW401_230905,							
0089_PW351_230905								
HDPE (no PTFE) (EP231X)								
0089_QC112_230905,	0089_PW405_230905 - Lab,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	03-Mar-2024	✓
0089_PW380_230905,	0089_PW381_230905,							
0089_PW350_230905,	0089_SW384_230905							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_SW408_230905 - Lab QC added,	0089_SW406_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_PW407_230905,	0089_PW401_230905,							
0089_PW351_230905								
HDPE (no PTFE) (EP231X)								
0089_QC112_230905,	0089_PW405_230905 - Lab,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	03-Mar-2024	✓
0089_PW380_230905,	0089_PW381_230905,							
0089_PW350_230905,	0089_SW384_230905							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	6	48	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	48	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	48	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2312186

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23

Client: Stantec

Project Manager: [redacted]

Phone: [redacted]

~~56861~~, 56863, 56862, 56859, 56864, 56856

ALS Compass COC Reference: 56858

Samples: 56898 56905 56870 56871 56902 56903

Sampler: [redacted]

Phone: [redacted]

Turnaround Requirements: Standard _____ Urgent _____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 05/09/2023	Date / Time: 6/9 1030	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 56863 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD407		05/09/2023 09:27 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD405		05/09/2023 09:27 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD380		05/09/2023 03:25 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD350		05/09/2023 03:25 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

Tuesday, September 5, 2023 7:28:27 AM

CHAIN OF CUSTODY

ALS COC#: 56863 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD407	HDPE Soil Jar	200 mL	00621122090687	Grey	No	
002	0089_SD405	HDPE Soil Jar	200 mL	00621122090603	Grey	No	
003	0089_SD380	HDPE Soil Jar	200 mL	00621122090582	Grey	No	
004	0089_SD350	HDPE Soil Jar	200 mL	00621122090672	Grey	No	

Total Bottle Count: ALS: 4, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312186**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 56863	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - SC		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2023 10:30	Issue Date	: 06-Sep-2023
Client Requested Due Date	: 15-Sep-2023	Scheduled Reporting Date	: **15-Sep-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 10.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2312186-001	05-Sep-2023 09:27	0089_SD407_230905	✓	✓
EP2312186-002	05-Sep-2023 09:27	0089_SD405_230905	✓	✓
EP2312186-003	05-Sep-2023 15:25	0089_SD380_230905	✓	✓
EP2312186-004	05-Sep-2023 15:25	0089_SD350_230905	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312186**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: 56863	Issue Date	: 14-Sep-2023 14:00
Sampler	: [redacted]		
Site	: Stirling SD - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD407_230905	0089_SD405_230905	0089_SD380_230905	0089_SD350_230905	----
				Sampling date / time	05-Sep-2023 09:27	05-Sep-2023 09:27	05-Sep-2023 15:25	05-Sep-2023 15:25	----
Compound	CAS Number	LOR	Unit		EP2312186-001	EP2312186-002	EP2312186-003	EP2312186-004	--------
					Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**30.2**	**30.2**	**23.4**	**23.4**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD407_230905	0089_SD405_230905	0089_SD380_230905	0089_SD350_230905	----
				Sampling date / time	05-Sep-2023 09:27	05-Sep-2023 09:27	05-Sep-2023 15:25	05-Sep-2023 15:25	----
Compound	CAS Number	LOR	Unit		EP2312186-001	EP2312186-002	EP2312186-003	EP2312186-004	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**109**	**104**	**110**	**106**	----
13C8-PFOA	----	0.0002	%		**96.0**	**95.5**	**98.5**	**99.0**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2312186**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: 56863	Issue Date	: 14-Sep-2023
Sampler	: [redacted]		
Site	: Stirling SD - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5292627)									
EP2312171-001	Anonymous	EA055: Moisture Content	----	0.1	%	26.0	26.9	3.5	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5281119)									
EP2312171-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2312180-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5281119)									
EP2312171-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5281119) - continued									
EP2312171-001	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2312180-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5281119)									
EP2312171-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312180-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5281119)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5281119) - continued									
EP2312171-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312180-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5281119)									
EP2312171-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2312180-003	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5281119)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	116	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	91.5	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	104	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	96.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5281119)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	106	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	110	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5281119)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.7	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281119)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281119) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	103	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	102	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	118	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	98.3	54.8	124
EP231P: PFAS Sums (QCLot: 5281119)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5281119)							
EP2312171-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	120	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	113	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	104	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	109	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	105	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	111	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5281119)							
EP2312171-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	105	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	97.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	101	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	105	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	114	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	105	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	111	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	113	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	122	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	106	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5281119)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5281119) - continued							
EP2312171-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	95.6	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	114	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	123	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	114	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	116	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	118	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281119)							
EP2312171-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	106	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	109	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	102	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312186**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: Stirling SD - SC	Issue Date	: 14-Sep-2023
Sampler	: [redacted]	No. of samples received	: 4
Order number	: pfas-omp/Stirling	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD407_230905, 0089_SD405_230905, 0089_SD380_230905, 0089_SD350_230905	**05-Sep-2023**	**----**	----	----	**12-Sep-2023**	19-Sep-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD407_230905, 0089_SD405_230905, 0089_SD380_230905, 0089_SD350_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD407_230905, 0089_SD405_230905, 0089_SD380_230905, 0089_SD350_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD407_230905, 0089_SD405_230905, 0089_SD380_230905, 0089_SD350_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD407_230905, 0089_SD405_230905, 0089_SD380_230905, 0089_SD350_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD407_230905, 0089_SD405_230905, 0089_SD380_230905, 0089_SD350_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2312187

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

ALS Compass COC Reference: 56858 **# Samples:** 56898 56905 56870 56871 56902 56903 **Phone:** ( )

Sampler: [redacted]

Phone: ( )

~~56861~~, 56863, 56862, 56859, 56864, 56856

Turnaround Requirements: (Standard) _____ Urgent _____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 05/09/2023	Date / Time: 6/9 1030	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 56864 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard Info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW228	Lab QC added	05/09/2023 09:13 AM	WATER	ALS: 5 Non ALS: 0	No	X		
002	0089_MW227		05/09/2023 09:15 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW259		05/09/2023 11:01 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_QC117		05/09/2023 11:01 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW257	Lab QCs added	05/09/2023 11:03 AM	WATER	ALS: 5 Non ALS: 0	No	X		
006	0089_MW258		05/09/2023 11:19 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_MW255		05/09/2023 11:39 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 56864 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_MW256		05/09/2023 11:50 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_MW236	Lab QCs added	05/09/2023 12:04 PM	WATER	ALS: 5 Non ALS: 0	No	X		
10	0089-MW240				3				
11	0089-MW225				2				

CHAIN OF CUSTODY

ALS COC#: 56864 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW228	Clear Plastic Bottle - Natural	125 mL	00070522068897	Green	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00350822007773	Grey	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00350822007977	Grey	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00351221006013	Grey	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00351221005967	Grey	No	
001	0089_MW228	HDPE (no PTFE)	125 mL	00070522068869	Green	No	
002	0089_MW227	Clear Plastic Bottle - Natural	20 mL	00350822007789	Grey	No	
002	0089_MW227	HDPE (no PTFE)	20 mL	00350822007940	Grey	No	
002	0089_MW227	HDPE (no PTFE)	20 mL	00350822062657	Grey	No	
003	0089_MW259	HDPE (no PTFE)	20 mL	00350822062621	Grey	No	
003	0089_MW259	HDPE (no PTFE)	125 mL	00070522068218	Green	No	
003	0089_MW259	Clear Plastic Bottle - Natural	125 mL	00070522068910	Green	No	
004	0089_QC117	Clear Plastic Bottle - Natural	20 mL	00350822064027	Grey	No	
004	0089_QC117	HDPE (no PTFE)	20 mL	00350822007979	Grey	No	
004	0089_QC117	HDPE (no PTFE)	20 mL	00350822007778	Grey	No	
005	0089_MW257	HDPE (no PTFE)	125 mL	00070522068798	Green	No	
005	0089_MW257	Clear Plastic Bottle - Natural	20 mL	00350822007797	Grey	No	
005	0089_MW257	HDPE (no PTFE)	20 mL	00351221005914	Grey	No	
005	0089_MW257	HDPE (no PTFE)	20 mL	00351221005805	Grey	No	
005	0089_MW257	HDPE (no PTFE)	125 mL	00070522068976	Green	No	
006	0089_MW258	Clear Plastic Bottle - Natural	20 mL	00350822007821	Grey	No	
006	0089_MW258	HDPE (no PTFE)	20 mL	00350822007900	Grey	No	
006	0089_MW258	HDPE (no PTFE)	20 mL	00350822008005	Grey	No	
007	0089_MW255	HDPE (no PTFE)	125 mL	00070522068954	Green	No	
007	0089_MW255	Clear Plastic Bottle - Natural	20 mL	00350822008023	Grey	No	
007	0089_MW255	HDPE (no PTFE)	20 mL	00350822007827	Grey	No	
008	0089_MW256	HDPE (no PTFE)					

Tuesday, September 5, 2023 7:29:23 AM

CHAIN OF CUSTODY

(ALS) COC#: 56864 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_MW256	HDPE (no PTFE)	20 mL	00350822007936	Grey	No	
008	0089_MW256	Clear Plastic Bottle - Natural	125 mL	00070522068939	Green	No	
009	0089_MW236	HDPE (no PTFE)	20 mL	00350822007952	Grey	No	
009	0089_MW236	HDPE (no PTFE)	20 mL	00350822007945	Grey	No	
009	0089_MW236	Clear Plastic Bottle - Natural	125 mL	00070522068842	Green	No	
009	0089_MW236	HDPE (no PTFE)	20 mL	00351221006035	Grey	No	
009	0089_MW236	HDPE (no PTFE)	20 mL	00351221005843	Grey	No	

Total Bottle Count: ALS: 33, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312187**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 56864	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - SC		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2023 10:30	Issue Date	: 07-Sep-2023
Client Requested Due Date	: 15-Sep-2023	Scheduled Reporting Date	: **14-Sep-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 10.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EP2312187-001 : 05-Sep-2023 09:13 : 0089_MW228_230905 - Lab QC added
EP2312187-005 : 05-Sep-2023 11:03 : 0089_MW257_230905 - Lab QCs added
EP2312187-009 : 05-Sep-2023 12:04 : 0089_MW236_230905 - Lab QCs added

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2312187-001	05-Sep-2023 09:13	0089_MW228_230905 L...	✓	✓
EP2312187-002	05-Sep-2023 09:15	0089_MW227_230905	✓	✓
EP2312187-003	05-Sep-2023 11:01	0089_MW259_230905	✓	✓
EP2312187-004	05-Sep-2023 11:01	0089_QC117_230905	✓	✓
EP2312187-005	05-Sep-2023 11:03	0089_MW257_230905 L...	✓	✓
EP2312187-006	05-Sep-2023 11:19	0089_MW258_230905	✓	✓
EP2312187-007	05-Sep-2023 11:39	0089_MW255_230905	✓	✓
EP2312187-008	05-Sep-2023 11:50	0089_MW256_230905	✓	✓
EP2312187-009	05-Sep-2023 12:04	0089_MW236_230905 L...	✓	✓
EP2312187-010	05-Sep-2023 00:00	0089_MW240_230905	✓	✓
EP2312187-011	05-Sep-2023 00:00	0089_MW225_230904	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312187**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56864	Issue Date	: 15-Sep-2023 21:45
Sampler	: [redacted]		
Site	: Stirling GW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW228_230905 Lab QC added	0089_MW227_230905	0089_MW259_230905	0089_QC117_230905	0089_MW257_230905 Lab QCs added
				Sampling date / time	05-Sep-2023 09:13	05-Sep-2023 09:15	05-Sep-2023 11:01	05-Sep-2023 11:01	05-Sep-2023 11:03
					EP2312187-001	EP2312187-002	EP2312187-003	EP2312187-004	EP2312187-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**749**	**381**	**301**	**307**	**128**
Total Alkalinity as CaCO3	----	1	mg/L		**749**	**381**	**301**	**307**	**128**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**440**	**216**	**11**	**11**	**6**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**2380**	**716**	**28**	**28**	**17**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**121**	**90**	**106**	**107**	**51**
Magnesium	7439-95-4	1	mg/L		**242**	**60**	**15**	**15**	**6**
Sodium	7440-23-5	1	mg/L		**1350**	**407**	**20**	**19**	**10**
Potassium	7440-09-7	1	mg/L		**92**	**27**	**2**	**2**	**1**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**91.3**	**32.3**	**7.03**	**7.15**	**3.16**
ø Total Cations	----	0.01	meq/L		**87.0**	**27.8**	**7.44**	**7.45**	**3.50**
ø Ionic Balance	----	0.01	%		**2.37**	**7.46**	**2.85**	**2.04**	**5.06**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.25**	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.17**	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.36**	<0.01	**0.09**	**0.10**	**0.16**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	**0.08**	**0.09**	**0.36**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**1.0**	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**3.16**	<0.02	**0.12**	**0.14**	**0.11**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**3.70**	<0.02	**0.09**	**0.09**	**0.08**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_230905 Lab QC added	0089_MW227_230905	0089_MW259_230905	0089_QC117_230905	0089_MW257_230905 Lab QCs added
				Sampling date / time	05-Sep-2023 09:13	05-Sep-2023 09:15	05-Sep-2023 11:01	05-Sep-2023 11:01	05-Sep-2023 11:03
Compound	CAS Number	LOR	Unit		EP2312187-001	EP2312187-002	EP2312187-003	EP2312187-004	EP2312187-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.97**	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.16**	<0.01	<0.01	<0.01	**0.03**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.45**	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_230905 Lab QC added	0089_MW227_230905	0089_MW259_230905	0089_QC117_230905	0089_MW257_230905 Lab QCs added
				Sampling date / time	05-Sep-2023 09:13	05-Sep-2023 09:15	05-Sep-2023 11:01	05-Sep-2023 11:01	05-Sep-2023 11:03
Compound	CAS Number	LOR	Unit		EP2312187-001	EP2312187-002	EP2312187-003	EP2312187-004	EP2312187-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**10.2**	<0.01	**0.38**	**0.42**	**0.74**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.36**	<0.01	**0.17**	**0.19**	**0.52**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**10.0**	<0.01	**0.38**	**0.42**	**0.74**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**100**	**102**	**111**	**99.9**
13C8-PFOA	----	0.02	%		**95.7**	**95.5**	**99.3**	**105**	**101**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW258_230905	0089_MW255_230905	0089_MW256_230905	0089_MW236_230905 Lab QCs added	0089_MW240_230905
				Sampling date / time	05-Sep-2023 11:19	05-Sep-2023 11:39	05-Sep-2023 11:50	05-Sep-2023 12:04	05-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312187-006	EP2312187-007	EP2312187-008	EP2312187-009	EP2312187-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		325	341	427	264	261
Total Alkalinity as CaCO3	----	1	mg/L		325	341	427	264	261
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		139	30	26	19	40
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		234	76	210	31	55
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		130	90	103	85	92
Magnesium	7439-95-4	1	mg/L		46	23	30	15	11
Sodium	7440-23-5	1	mg/L		104	55	113	22	31
Potassium	7440-09-7	1	mg/L		16	3	6	<1	3
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		16.0	9.58	15.0	6.54	7.60
ø Total Cations	----	0.01	meq/L		15.2	8.85	12.7	6.43	6.92
ø Ionic Balance	----	0.01	%		2.51	3.95	8.38	0.86	4.67
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.47	0.53	2.11	0.19	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.35	0.48	1.67	0.37	0.06
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		1.56	11.4	6.35	14.1	2.59
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.12	0.04	0.26	0.57	0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		2.81	0.65	5.69	53.6	0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		0.4	0.2	0.5	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		1.38	0.22	0.72	0.11	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		1.24	1.21	3.60	0.67	0.10

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW258_230905	0089_MW255_230905	0089_MW256_230905	0089_MW236_230905 Lab QCs added	0089_MW240_230905
				Sampling date / time	05-Sep-2023 11:19	05-Sep-2023 11:39	05-Sep-2023 11:50	05-Sep-2023 12:04	05-Sep-2023 00:00
					EP2312187-006	EP2312187-007	EP2312187-008	EP2312187-009	EP2312187-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.33**	**0.30**	**0.27**	**0.24**	**0.03**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.18**	**0.05**	**0.31**	**1.45**	**0.08**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	**2.52**	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	**0.02**	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.20**	<0.05	**0.21**	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW258_230905	0089_MW255_230905	0089_MW256_230905	0089_MW236_230905 Lab QCs added	0089_MW240_230905
				Sampling date / time	05-Sep-2023 11:19	05-Sep-2023 11:39	05-Sep-2023 11:50	05-Sep-2023 12:04	05-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312187-006	EP2312187-007	EP2312187-008	EP2312187-009	EP2312187-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**9.04**	**15.1**	**21.7**	**73.8**	**2.89**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**4.37**	**12.0**	**12.0**	**67.7**	**2.60**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**8.57**	**14.6**	**19.8**	**70.4**	**2.81**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**106**	**98.5**	**100**	**106**
13C8-PFOA	----	0.02	%		**104**	**103**	**105**	**101**	**96.6**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW225_230904	----	----	----	----
				Sampling date / time	05-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312187-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW225_230904	----	----	----	----
				Sampling date / time	05-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312187-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	----	----	----	----
13C8-PFOA	----	0.02	%		**103**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	***Low***	***High***
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2312187**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56864	Issue Date	: 15-Sep-2023
Sampler	: [redacted]		
Site	: Stirling GW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5292131)									
EP2312184-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	126	125	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	126	125	1.0	0% - 20%
EP2312187-006	0089_MW258_230905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	325	325	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	325	325	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5281229)									
EP2312178-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2430	2410	0.9	0% - 20%
EP2312187-004	0089_QC117_230905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	11	10	0.0	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 5281230)									
EP2312178-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17800	18100	1.4	0% - 20%
EP2312187-004	0089_QC117_230905	ED045G: Chloride	16887-00-6	1	mg/L	28	28	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5283125)									
EP2312161-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EP2312184-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	469	460	1.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1520	1500	1.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	11700	1.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	577	565	2.1	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED093F: Dissolved Major Cations (QC Lot: 5283131)									
EP2312183-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	247	256	3.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	557	574	2.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3520	3620	2.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	182	187	3.0	0% - 20%
EP2312188-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	427	445	4.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1430	3.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10800	11200	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	540	561	3.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5284268)									
EP2312170-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	90	90	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	98	97	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1230	1230	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	63	64	0.0	0% - 20%
EP2312183-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	61	60	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	59	58	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	124	121	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5283025)									
EP2312183-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5283094)									
EP2312183-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2312187-009	0089_MW236_230905 Lab QCs added	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	14.1	15.2	7.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	53.6	57.7	7.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.19	0.19	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.37	0.35	4.1	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.57	0.56	0.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5283025)									

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5283025) - continued									
EP2312183-005	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5283094)									
EP2312183-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2312187-009	0089_MW236_230905 Lab QCs added	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.45	1.46	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.11	0.10	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.67	0.67	0.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.24	0.23	0.0	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	2.52	2.49	1.3	0% - 20%
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5283025)									
EP2312183-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5283025) - continued									
EP2312183-005	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5283094)									
EP2312183-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2312187-009	0089_MW236_230905 Lab QCs added	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5283025)									
EP2312183-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5283025) - continued									
EP2312183-005	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5283094)									
EP2312183-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2312187-009	0089_MW236_230905 Lab QCs added	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5283025)									
EP2312183-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.05	0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5283094)									
EP2312183-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2312187-009	0089_MW236_230905 Lab QCs added	EP231X: Sum of PFAS	----	0.01	µg/L	73.8	79.0	6.7	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	67.7	72.9	7.4	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	70.4	75.6	7.1	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5292131)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	85.1	126
				<1	200 mg/L	102	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281229)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.6	89.9	112
				<1	500 mg/L	94.7	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5281230)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	93.8	88.6	113
				<1	1000 mg/L	106	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5283125)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.4	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	94.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.8	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5283131)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.3	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5284268)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283025)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	112	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	106	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	114	68.0	131

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283025) - continued								
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	130	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	106	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	108	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283094)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	95.1	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	87.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	85.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283025)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	108	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	109	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	110	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	108	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	121	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	115	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	120	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	113	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283094)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	86.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	92.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	85.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	83.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	94.8	71.0	132

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283025)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	114	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	124	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	116	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	113	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	95.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283094)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	80.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	76.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	79.9	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	101	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.9	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	84.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	77.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283025)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	120	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	117	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	117	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283094)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	92.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	93.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	94.2	64.2	133
EP231P: PFAS Sums (QCLot: 5283025)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5283025) - continued								
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5283094)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281229)							
EP2312178-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5281230)							
EP2312178-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283025)							
EP2312187-005	0089_MW257_230905 Lab QCs added	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	112	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	120	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	126	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	109	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	109	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283094)							
EP2312187-001	0089_MW228_230905 Lab QC added	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	95.5	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	95.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	77.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	94.5	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	83.9	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	79.5	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283025)							
EP2312187-005	0089_MW257_230905 Lab QCs added	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	101	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	121	72.0	129

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283025) - continued							
EP2312187-005	0089_MW257_230905 Lab QCs added	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	108	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	110	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	103	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	102	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	113	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	107	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	118	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	126	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	114	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283094)							
EP2312187-001	0089_MW228_230905 Lab QC added	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.3	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	# Not Determined	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	89.5	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	93.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	103	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	99.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283025)							
EP2312187-005	0089_MW257_230905 Lab QCs added	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	111	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	102	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	98.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	120	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	120	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	119	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283094)							
EP2312187-001	0089_MW228_230905 Lab QC added	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	86.2	59.0	135

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283094) - continued							
EP2312187-001	0089_MW228_230905 Lab QC added	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	85.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	97.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	92.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	99.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283025)							
EP2312187-005	0089_MW257_230905 Lab QCs added	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	117	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	105	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	107	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283094)							
EP2312187-001	0089_MW228_230905 Lab QC added	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	97.0	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	64.5	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	98.1	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.6	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312187**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: Stirling GW - SC	Issue Date	: 15-Sep-2023
Sampler	: [redacted]	No. of samples received	: 11
Order number	: pfas-omp/Stirling	No. of samples analysed	: 11

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2312178--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2312178--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2312187--001	0089_MW228_230905 Lab QC	**Perfluoropentanoic acid (PFPeA)**	2706-90-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2312187--001	0089_MW228_230905 Lab QC	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2312187--001	0089_MW228_230905 Lab QC	**Perfluoroheptanoic acid (PFHpA)**	375-85-9	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_MW228_230905 - Lab QC added, 0089_MW259_230905, 0089_MW257_230905 - Lab QCs added, 0089_MW240_230905	0089_MW227_230905, 0089_QC117_230905, 0089_MW258_230905,	----	----	----	13-Sep-2023	12-Sep-2023	**1**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW228_230905 - Lab QC added,	0089_MW227_230905,	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	19-Sep-2023	✓
0089_MW259_230905,	0089_QC117_230905,							
0089_MW257_230905 - Lab QCs added,	0089_MW258_230905,							
0089_MW255_230905,	0089_MW256_230905,							
0089_MW236_230905 - Lab QCs added,	0089_MW240_230905							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW228_230905 - Lab QC added,	0089_MW227_230905,	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	03-Oct-2023	✓
0089_MW259_230905,	0089_QC117_230905,							
0089_MW257_230905 - Lab QCs added,	0089_MW258_230905,							
0089_MW255_230905,	0089_MW256_230905,							
0089_MW236_230905 - Lab QCs added,	0089_MW240_230905							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW228_230905 - Lab QC added,	0089_MW227_230905,	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	03-Oct-2023	✓
0089_MW259_230905,	0089_QC117_230905,							
0089_MW257_230905 - Lab QCs added,	0089_MW258_230905,							
0089_MW255_230905,	0089_MW256_230905,							
0089_MW236_230905 - Lab QCs added,	0089_MW240_230905							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_MW228_230905 - Lab QC added,	0089_MW227_230905,	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	12-Sep-2023	×
0089_MW259_230905,	0089_QC117_230905,							
0089_MW257_230905 - Lab QCs added,	0089_MW258_230905							
Clear Plastic Bottle - Natural (ED093F)								
0089_MW255_230905,	0089_MW256_230905,	**05-Sep-2023**	**----**	----	----	**12-Sep-2023**	12-Sep-2023	✓
0089_MW236_230905 - Lab QCs added								
Clear Plastic Bottle - Natural (ED093F)								
0089_MW240_230905		**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	12-Sep-2023	×
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_QC117_230905,	0089_MW257_230905 - Lab QCs added,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**07-Sep-2023**	03-Mar-2024	✓
0089_MW255_230905,	0089_MW256_230905,							
0089_MW225_230904								
HDPE (no PTFE) (EP231X)								
0089_MW228_230905 - Lab QC added,	0089_MW227_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_MW259_230905,	0089_MW258_230905,							
0089_MW236_230905 - Lab QCs added,	0089_MW240_230905							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_QC117_230905, 0089_MW255_230905, 0089_MW225_230904	0089_MW257_230905 - Lab QCs added, 0089_MW256_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**07-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW228_230905 - Lab QC added, 0089_MW259_230905, 0089_MW236_230905 - Lab QCs added,	0089_MW227_230905, 0089_MW258_230905, 0089_MW240_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_QC117_230905, 0089_MW255_230905, 0089_MW225_230904	0089_MW257_230905 - Lab QCs added, 0089_MW256_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**07-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW228_230905 - Lab QC added, 0089_MW259_230905, 0089_MW236_230905 - Lab QCs added,	0089_MW227_230905, 0089_MW258_230905, 0089_MW240_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_QC117_230905, 0089_MW255_230905, 0089_MW225_230904	0089_MW257_230905 - Lab QCs added, 0089_MW256_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**07-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW228_230905 - Lab QC added, 0089_MW259_230905, 0089_MW236_230905 - Lab QCs added,	0089_MW227_230905, 0089_MW258_230905, 0089_MW240_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_QC117_230905, 0089_MW255_230905, 0089_MW225_230904	0089_MW257_230905 - Lab QCs added, 0089_MW256_230905,	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**07-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW228_230905 - Lab QC added, 0089_MW259_230905, 0089_MW236_230905 - Lab QCs added,	0089_MW227_230905, 0089_MW258_230905, 0089_MW240_230905	**05-Sep-2023**	**07-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	6	48	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	20	**15.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	48	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	48	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2312188

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

ALS Compass COC Reference: ~~56861~~, 56863, 56862, 56859, 56864, 56856 **# Samples:** 56898 56905 56870 56871 56902 56903 **Phone:** ( )

Sampler: [redacted] **Phone:** ( )

Turnaround Requirements: (Standard) Urgent

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 05/09/2023	Date / Time: 6/9 1030	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 56859 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW130		05/09/2023 09:21 AM	WATER	ALS: 5 Non ALS: 0	No	X		
002	0089_PW335		05/09/2023 09:26 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW364		05/09/2023 09:37 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW363		05/09/2023 10:13 AM	WATER	ALS: 5 Non ALS: 0	No	X		
005	0089_SW134		05/09/2023 10:40 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_PW341		05/09/2023 10:49 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW362		05/09/2023 11:00 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 56859 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_SW132		05/09/2023 11:30 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_PW340		05/09/2023 11:32 AM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_QC118		05/09/2023 11:32 AM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_PW352		05/09/2023 03:20 PM	WATER	ALS: 5 Non ALS: 0	No	X		
012	0089_SW383		05/09/2023 03:21 PM	WATER	ALS: 3 Non ALS: 0	No	X		
013	0089_SW382		05/09/2023 03:22 PM	WATER	ALS: 3 Non ALS: 0	No	X		
014	0089_SW353		05/09/2023 03:29 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 56859 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW130	HDPE (no PTFE)	20 mL	00350822007754	Grey	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00350822007767	Grey	No	
001	0089_SW130	Clear Plastic Bottle - Natural	125 mL	00070522068754	Green	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00351221006029	Grey	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00351221005867	Grey	No	
002	0089_PW335	HDPE (no PTFE)	20 mL	00350822007766	Grey	No	
002	0089_PW335	Clear Plastic Bottle - Natural	125 mL	00070522068839	Green	No	
002	0089_PW335	HDPE (no PTFE)	20 mL	00350822007955	Grey	No	
003	0089_PW364	Clear Plastic Bottle - Natural	125 mL	00070522068907	Green	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00350822007768	Grey	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00350822007814	Grey	No	
004	0089_PW363	Clear Plastic Bottle - Natural	125 mL	00070522068756	Green	No	
004	0089_PW363	HDPE (no PTFE)	20 mL	00350822007908	Grey	No	
004	0089_PW363	HDPE (no PTFE)	20 mL	00350822007880	Grey	No	
004	0089_PW363	HDPE (no PTFE)	20 mL	00350822007818	Grey	No	
004	0089_PW363	HDPE (no PTFE)	20 mL	00350822007999	Grey	No	
005	0089_SW134	Clear Plastic Bottle - Natural	125 mL	00070522068824	Green	No	
005	0089_SW134	HDPE (no PTFE)	20 mL	00350822007847	Grey	No	
005	0089_SW134	HDPE (no PTFE)	20 mL	00350822007828	Grey	No	
006	0089_PW341	HDPE (no PTFE)	20 mL	00350822007803	Grey	No	
006	0089_PW341	HDPE (no PTFE)	20 mL	00350822007927	Grey	No	
006	0089_PW341	Clear Plastic Bottle - Natural	125 mL	00070522068800	Green	No	
007	0089_PW362	HDPE (no PTFE)	20 mL	00350822007780	Grey	No	
007	0089_PW362	Clear Plastic Bottle - Natural	125 mL	00070522068769	Green	No	
007	0089_PW362	HDPE (no PTFE)	20 mL	00350822007741	Grey	No	
008	0089_SW132	Clear Plastic Bottle - Natural	125 mL	00070522068784	Green	No	

CHAIN OF CUSTODY

ALS COC#: 56859 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_SW132	HDPE (no PTFE)	20 mL	00350822007842	Grey	No	
008	0089_SW132	HDPE (no PTFE)	20 mL	00350822007765	Grey	No	
009	0089_PW340	Clear Plastic Bottle - Natural	125 mL	00070522068706	Green	No	
009	0089_PW340	HDPE (no PTFE)	20 mL	00351221006144	Grey	No	
009	0089_PW340	HDPE (no PTFE)	20 mL	00351221006022	Grey	No	
010	0089_QC118	HDPE (no PTFE)	20 mL	00350822007929	Grey	No	
010	0089_QC118	Clear Plastic Bottle - Natural	125 mL	00070522068812	Green	No	
010	0089_QC118	HDPE (no PTFE)	20 mL	00350822007894	Grey	No	
011	0089_PW352	HDPE (no PTFE)	20 mL	00350822007845	Grey	No	
011	0089_PW352	HDPE (no PTFE)	20 mL	00350822007751	Grey	No	
011	0089_PW352	Clear Plastic Bottle - Natural	125 mL	00070522068874	Green	No	
011	0089_PW352	HDPE (no PTFE)	20 mL	00351221005798	Grey	No	
012	0089_SW383	HDPE (no PTFE)	20 mL	00351221006189	Grey	No	
012	0089_SW383	Clear Plastic Bottle - Natural	125 mL	00070522068742	Green	No	
012	0089_SW383	HDPE (no PTFE)	20 mL	00351221005848	Grey	No	
013	0089_SW382	HDPE (no PTFE)	20 mL	00351221005881	Grey	No	
013	0089_SW382	HDPE (no PTFE)	20 mL	00350822007864	Grey	No	
013	0089_SW382	Clear Plastic Bottle - Natural	125 mL	00070522068794	Green	No	
014	0089_SW353	Clear Plastic Bottle - Natural	125 mL	00070522068868	Green	No	
014	0089_SW353	HDPE (no PTFE)	20 mL	00351221006017	Grey	No	
014	0089_SW353	HDPE (no PTFE)	20 mL	00351221006070	Grey	No	

Total Bottle Count: ALS: 48, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312188**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 56859	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2023 10:30	Issue Date	: 06-Sep-2023
Client Requested Due Date	: 15-Sep-2023	Scheduled Reporting Date	: **15-Sep-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 10.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 14 / 14

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2312188-001	05-Sep-2023 09:21	0089_SW130_230905	✓	✓
EP2312188-002	05-Sep-2023 09:26	0089_PW335_230905	✓	✓
EP2312188-003	05-Sep-2023 09:37	0089_PW364_230905	✓	✓
EP2312188-004	05-Sep-2023 10:13	0089_PW363_230905	✓	✓
EP2312188-005	05-Sep-2023 10:40	0089_SW134_230905	✓	✓
EP2312188-006	05-Sep-2023 10:49	0089_PW341_230905	✓	✓
EP2312188-007	05-Sep-2023 11:00	0089_PW362_230905	✓	✓
EP2312188-008	05-Sep-2023 11:30	0089_SW132_230905	✓	✓
EP2312188-009	05-Sep-2023 11:32	0089_PW340_230905	✓	✓
EP2312188-010	05-Sep-2023 11:32	0089_QC118_230905	✓	✓
EP2312188-011	05-Sep-2023 15:20	0089_PW352_230905	✓	✓
EP2312188-012	05-Sep-2023 15:21	0089_SW383_230905	✓	✓
EP2312188-013	05-Sep-2023 15:22	0089_SW382_230905	✓	✓
EP2312188-014	05-Sep-2023 15:29	0089_SW353_230905	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312188**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56859	Issue Date	: 15-Sep-2023 17:04
Sampler	: [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 14		
No. of samples analysed	: 14		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Lab Technichian	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_230905	0089_PW335_230905	0089_PW364_230905	0089_PW363_230905	0089_SW134_230905
				Sampling date / time	05-Sep-2023 09:21	05-Sep-2023 09:26	05-Sep-2023 09:37	05-Sep-2023 10:13	05-Sep-2023 10:40
Compound	CAS Number	LOR	Unit		EP2312188-001	EP2312188-002	EP2312188-003	EP2312188-004	EP2312188-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		129	150	132	127	129
Total Alkalinity as CaCO3	----	1	mg/L		129	150	132	127	129
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2510	2540	2500	2580	2500
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18500	18400	18600	18800	19300
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		444	442	427	441	439
Magnesium	7439-95-4	1	mg/L		1440	1440	1380	1440	1430
Sodium	7440-23-5	1	mg/L		11400	11200	10800	11200	11200
Potassium	7440-09-7	1	mg/L		546	561	540	564	561
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		577	575	579	586	599
ø Total Cations	----	0.01	meq/L		650	642	618	642	641
ø Ionic Balance	----	0.01	%		6.01	5.52	3.26	4.52	3.39
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_230905	0089_PW335_230905	0089_PW364_230905	0089_PW363_230905	0089_SW134_230905
				Sampling date / time	05-Sep-2023 09:21	05-Sep-2023 09:26	05-Sep-2023 09:37	05-Sep-2023 10:13	05-Sep-2023 10:40
Compound	CAS Number	LOR	Unit		EP2312188-001	EP2312188-002	EP2312188-003	EP2312188-004	EP2312188-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_230905	0089_PW335_230905	0089_PW364_230905	0089_PW363_230905	0089_SW134_230905
				Sampling date / time	05-Sep-2023 09:21	05-Sep-2023 09:26	05-Sep-2023 09:37	05-Sep-2023 10:13	05-Sep-2023 10:40
Compound	CAS Number	LOR	Unit		EP2312188-001	EP2312188-002	EP2312188-003	EP2312188-004	EP2312188-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**109**	**113**	**106**	**114**	**107**
13C8-PFOA	----	0.02	%		**88.8**	**86.5**	**85.5**	**88.7**	**88.3**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW341_230905	0089_PW362_230905	0089_SW132_230905	0089_PW340_230905	0089_QC118_230905
				Sampling date / time	05-Sep-2023 10:49	05-Sep-2023 11:00	05-Sep-2023 11:30	05-Sep-2023 11:32	05-Sep-2023 11:32
Compound	CAS Number	LOR	Unit		EP2312188-006	EP2312188-007	EP2312188-008	EP2312188-009	EP2312188-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		130	125	130	136	136
Total Alkalinity as CaCO3	----	1	mg/L		130	125	130	136	136
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2440	2520	2370	2440	2460
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19300	19100	18900	19200	18400
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		434	450	431	431	426
Magnesium	7439-95-4	1	mg/L		1400	1460	1410	1410	1400
Sodium	7440-23-5	1	mg/L		10900	11400	11200	11200	11100
Potassium	7440-09-7	1	mg/L		548	571	508	504	500
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		598	594	585	595	573
ø Total Cations	----	0.01	meq/L		625	653	638	638	632
ø Ionic Balance	----	0.01	%		2.22	4.76	4.30	3.45	4.90
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW341_230905	0089_PW362_230905	0089_SW132_230905	0089_PW340_230905	0089_QC118_230905
				Sampling date / time	05-Sep-2023 10:49	05-Sep-2023 11:00	05-Sep-2023 11:30	05-Sep-2023 11:32	05-Sep-2023 11:32
Compound	CAS Number	LOR	Unit		EP2312188-006	EP2312188-007	EP2312188-008	EP2312188-009	EP2312188-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW341_230905	0089_PW362_230905	0089_SW132_230905	0089_PW340_230905	0089_QC118_230905
				Sampling date / time	05-Sep-2023 10:49	05-Sep-2023 11:00	05-Sep-2023 11:30	05-Sep-2023 11:32	05-Sep-2023 11:32
Compound	CAS Number	LOR	Unit		EP2312188-006	EP2312188-007	EP2312188-008	EP2312188-009	EP2312188-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**101**	**106**	**106**	**107**
13C8-PFOA	----	0.02	%		**89.2**	**90.7**	**83.7**	**87.2**	**88.5**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW352_230905	0089_SW383_230905	0089_SW382_230905	0089_SW353_230905	----
				Sampling date / time	05-Sep-2023 15:20	05-Sep-2023 15:21	05-Sep-2023 15:22	05-Sep-2023 15:29	----
Compound	CAS Number	LOR	Unit		EP2312188-011	EP2312188-012	EP2312188-013	EP2312188-014	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**128**	**127**	**124**	**124**	----
Total Alkalinity as CaCO3	----	1	mg/L		**128**	**127**	**124**	**124**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2480**	**2420**	**2500**	**2450**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19600**	**18100**	**18000**	**18400**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**421**	**427**	**429**	**428**	----
Magnesium	7439-95-4	1	mg/L		**1390**	**1410**	**1410**	**1420**	----
Sodium	7440-23-5	1	mg/L		**11000**	**11100**	**11100**	**11300**	----
Potassium	7440-09-7	1	mg/L		**496**	**500**	**500**	**505**	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**607**	**564**	**562**	**572**	----
ø Total Cations	----	0.01	meq/L		**626**	**633**	**633**	**643**	----
ø Ionic Balance	----	0.01	%		**1.58**	**5.80**	**5.92**	**5.77**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW352_230905	0089_SW383_230905	0089_SW382_230905	0089_SW353_230905	----
				Sampling date / time	05-Sep-2023 15:20	05-Sep-2023 15:21	05-Sep-2023 15:22	05-Sep-2023 15:29	----
Compound	CAS Number	LOR	Unit		EP2312188-011	EP2312188-012	EP2312188-013	EP2312188-014	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW352_230905	0089_SW383_230905	0089_SW382_230905	0089_SW353_230905	----
				Sampling date / time	05-Sep-2023 15:20	05-Sep-2023 15:21	05-Sep-2023 15:22	05-Sep-2023 15:29	----
Compound	CAS Number	LOR	Unit		EP2312188-011	EP2312188-012	EP2312188-013	EP2312188-014	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.4**	**99.9**	**102**	**102**	----
13C8-PFOA	----	0.02	%		**88.4**	**94.8**	**83.6**	**92.0**	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2312188**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: 56859	Issue Date	: 15-Sep-2023
Sampler	: [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 14		
No. of samples analysed	: 14		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Lab Technichian	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5292131)									
EP2312184-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	126	125	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	126	125	1.0	0% - 20%
EP2312187-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	325	325	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	325	325	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5292132)									
EP2312188-006	0089_PW341_230905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	130	132	1.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	130	132	1.3	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5281216)									
EP2312177-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	----	----	----	No Limit
EP2312188-005	0089_SW134_230905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2500	2470	1.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5281217)									
EP2312177-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	----	----	----	No Limit
EP2312188-005	0089_SW134_230905	ED045G: Chloride	16887-00-6	1	mg/L	19300	19800	2.2	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5283125)									
EP2312161-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5283125) - continued									
EP2312161-001	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EP2312184-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	469	460	1.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1520	1500	1.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	11700	1.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	577	565	2.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5283131)									
EP2312183-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	247	256	3.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	557	574	2.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3520	3620	2.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	182	187	3.0	0% - 20%
EP2312188-003	0089_PW364_230905	ED093F: Calcium	7440-70-2	1	mg/L	427	445	4.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1430	3.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10800	11200	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	540	561	3.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5284269)									
EP2312188-008	0089_SW132_230905	ED093F: Calcium	7440-70-2	1	mg/L	431	430	0.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1410	1410	0.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11200	11200	0.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	508	506	0.4	0% - 20%
EP2312248-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	27	26	5.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	2	1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	58	56	4.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5283791)									
EP2312188-001	0089_SW130_230905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5285887)									
EP2312184-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5283791)									
EP2312188-001	0089_SW130_230905	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5283791) - continued									
EP2312188-001	0089_SW130_230905	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5285887)									
EP2312184-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5283791)									
EP2312188-001	0089_SW130_230905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5285887)									
EP2312184-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5285887) - continued									
EP2312184-002	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5283791)									
EP2312188-001	0089_SW130_230905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5285887)									
EP2312184-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5283791)									
EP2312188-001	0089_SW130_230905	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5285887)									
EP2312184-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5292131)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	85.1	126
				<1	200 mg/L	102	90.5	111
ED037P: Alkalinity by PC Titrator (QCLot: 5292132)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	85.1	126
				<1	200 mg/L	103	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281216)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.0	89.9	112
				<1	500 mg/L	95.1	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5281217)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	88.6	113
				<1	1000 mg/L	93.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5283125)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.4	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	94.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.8	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5283131)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.3	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5284269)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED093F: Dissolved Major Cations (QCLot: 5284269) - continued								
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.5	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283791)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	91.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	82.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	77.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	85.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	86.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	85.9	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5285887)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	88.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	80.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	83.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	79.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	81.3	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283791)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.9	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	77.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	86.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	77.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	82.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	79.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	93.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5285887)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	83.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	81.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)
						LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5285887) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	85.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	89.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	83.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	93.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283791)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	76.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	73.5	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	82.1	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	87.2	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	85.5	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	89.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5285887)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	77.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	77.5	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.1	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	84.2	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	93.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	71.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283791)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	86.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	89.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	103	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	91.3	64.2	133

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5285887)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	82.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	83.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	92.7	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	77.4	64.2	133
EP231P: PFAS Sums (QCLot: 5283791)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5285887)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281216)							
EP2312177-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	----		70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5281217)							
EP2312177-001	Anonymous	ED045G: Chloride	16887-00-6	----		70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5283791)							
EP2312188-004	0089_PW363_230905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.0	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	84.1	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	79.1	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	86.3	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	87.7	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	73.7	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5285887)							
EP2312188-011	0089_PW352_230905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	89.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	86.4	71.0	127

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5285887) - continued							
EP2312188-011	0089_PW352_230905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	80.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	83.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	87.1	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	84.0	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5283791)							
EP2312188-004	0089_PW363_230905	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	93.6	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	79.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	85.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	84.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.3	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	90.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	82.2	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	88.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	85.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	87.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	94.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5285887)							
EP2312188-011	0089_PW352_230905	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	81.2	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	85.4	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	81.2	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	83.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	81.6	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	83.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	87.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	86.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	86.8	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	84.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	90.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283791)							
EP2312188-004	0089_PW363_230905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	76.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	78.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	81.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	102	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	89.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	96.2	65.0	136

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5283791) - continued							
EP2312188-004	0089_PW363_230905	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	79.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5285887)							
EP2312188-011	0089_PW352_230905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	72.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	82.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	88.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	94.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	87.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	86.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	75.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5283791)							
EP2312188-004	0089_PW363_230905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	92.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	89.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	85.5	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5285887)							
EP2312188-011	0089_PW352_230905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	80.3	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	76.3	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	84.2	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	79.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312188**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: Stirling SW/PW - JS	Issue Date	: 15-Sep-2023
Sampler	: [redacted]	No. of samples received	: 14
Order number	: pfas-omp/Stirling	No. of samples analysed	: 14

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0089_SW130_230905,	0089_PW335_230905,	----	----	----	13-Sep-2023	12-Sep-2023	**1**
0089_PW364_230905,	0089_PW363_230905,						
0089_SW134_230905,	0089_PW341_230905,						
0089_PW362_230905							

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
	2				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	29	6.90	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW130_230905,	0089_PW335_230905,	**05-Sep-2023**	**----**	----	**----**	**13-Sep-2023**	19-Sep-2023	✓
0089_PW364_230905,	0089_PW363_230905,							
0089_SW134_230905,	0089_PW341_230905,							
0089_PW362_230905,	0089_SW132_230905,							
0089_PW340_230905,	0089_QC118_230905,							
0089_PW352_230905,	0089_SW383_230905,							
0089_SW382_230905,	0089_SW353_230905							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW130_230905, 0089_PW335_230905, 0089_PW364_230905, 0089_PW363_230905, 0089_SW134_230905, 0089_PW341_230905, 0089_PW362_230905, 0089_SW132_230905, 0089_PW340_230905, 0089_QC118_230905, 0089_PW352_230905, 0089_SW383_230905, 0089_SW382_230905, 0089_SW353_230905	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	03-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW130_230905, 0089_PW335_230905, 0089_PW364_230905, 0089_PW363_230905, 0089_SW134_230905, 0089_PW341_230905, 0089_PW362_230905, 0089_SW132_230905, 0089_PW340_230905, 0089_QC118_230905, 0089_PW352_230905, 0089_SW383_230905, 0089_SW382_230905, 0089_SW353_230905	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	03-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW130_230905, 0089_PW335_230905, 0089_PW364_230905, 0089_PW363_230905, 0089_SW134_230905, 0089_PW341_230905, 0089_PW362_230905	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	12-Sep-2023	×
Clear Plastic Bottle - Natural (ED093F)							
0089_SW132_230905, 0089_PW340_230905, 0089_QC118_230905, 0089_PW352_230905, 0089_SW383_230905, 0089_SW382_230905, 0089_SW353_230905	**05-Sep-2023**	**----**	----	----	**12-Sep-2023**	12-Sep-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW362_230905, 0089_PW352_230905, 0089_SW383_230905, 0089_SW353_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW130_230905, 0089_PW335_230905, 0089_PW364_230905, 0089_PW363_230905, 0089_SW134_230905, 0089_PW341_230905, 0089_SW132_230905, 0089_PW340_230905, 0089_QC118_230905, 0089_SW382_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	03-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW362_230905,	0089_PW352_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_SW383_230905,	0089_SW353_230905							
HDPE (no PTFE) (EP231X)								
0089_SW130_230905,	0089_PW335_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	03-Mar-2024	✓
0089_PW364_230905,	0089_PW363_230905,							
0089_SW134_230905,	0089_PW341_230905,							
0089_SW132_230905,	0089_PW340_230905,							
0089_QC118_230905,	0089_SW382_230905							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_PW362_230905,	0089_PW352_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_SW383_230905,	0089_SW353_230905							
HDPE (no PTFE) (EP231X)								
0089_SW130_230905,	0089_PW335_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	03-Mar-2024	✓
0089_PW364_230905,	0089_PW363_230905,							
0089_SW134_230905,	0089_PW341_230905,							
0089_SW132_230905,	0089_PW340_230905,							
0089_QC118_230905,	0089_SW382_230905							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW362_230905,	0089_PW352_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_SW383_230905,	0089_SW353_230905							
HDPE (no PTFE) (EP231X)								
0089_SW130_230905,	0089_PW335_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	03-Mar-2024	✓
0089_PW364_230905,	0089_PW363_230905,							
0089_SW134_230905,	0089_PW341_230905,							
0089_SW132_230905,	0089_PW340_230905,							
0089_QC118_230905,	0089_SW382_230905							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_PW362_230905,	0089_PW352_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	03-Mar-2024	✓
0089_SW383_230905,	0089_SW353_230905							
HDPE (no PTFE) (EP231X)								
0089_SW130_230905,	0089_PW335_230905,	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	03-Mar-2024	✓
0089_PW364_230905,	0089_PW363_230905,							
0089_SW134_230905,	0089_PW341_230905,							
0089_SW132_230905,	0089_PW340_230905,							
0089_QC118_230905,	0089_SW382_230905							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	3	29	**10.34**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	6	35	**17.14**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	29	**6.90**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	29	**13.79**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	35	**8.57**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	29	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	29	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	35	**8.57**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	29	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	29	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2312190

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager** [redacted]

ALS Compass COC Reference: 56858 **# Samples:** ~~56861~~, 56863, 56862, 56859, 56864, 56856, 56898, 56905, 56870, 56871, 56902, 56903 **Phone:** ( )

Sampler: [redacted]

Phone: ( )

Turnaround Requirements: (Standard) Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 05/09/2023	Date / Time: 6/9 1030	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 56858 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD335		05/09/2023 09:27 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD364		05/09/2023 09:34 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_QC113		05/09/2023 09:36 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD363		05/09/2023 10:13 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD341		05/09/2023 10:50 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD362		05/09/2023 10:59 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD340		05/09/2023 11:33 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 56858 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD335	HDPE Soil Jar	200 mL	00621122084067	Grey	No	
002	0089_SD364	HDPE Soil Jar	200 mL	00621122090645	Grey	No	
003	0089_QC113	HDPE Soil Jar	200 mL	00621122090601	Grey	No	
004	0089_SD363	HDPE Soil Jar	200 mL	00621122084053	Grey	No	
005	0089_SD341	HDPE Soil Jar	200 mL	00621122090606	Grey	No	
006	0089_SD362	HDPE Soil Jar	200 mL	00621222077134	Grey	No	
007	0089_SD340	HDPE Soil Jar	200 mL	00621122090622	Grey	No	
008	0089_SD351	HDPE Soil Jar	200 mL	00621222077104	Grey	No	
009	0089_SD401	HDPE Soil Jar	200 mL	00621222077147	Grey	No	
010	0089_SD381	HDPE Soil Jar	200 mL	00621122090634	Grey	No	
011	0089_SD352	HDPE Soil Jar	200 mL	00621122090673	Grey	No	

Total Bottle Count: ALS: 11, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312190**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 56858	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2023 10:30	Issue Date	: 06-Sep-2023
Client Requested Due Date	: 15-Sep-2023	Scheduled Reporting Date	: **15-Sep-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 10.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2312190-001	05-Sep-2023 09:27	0089_SD335_230905	✓	✓
EP2312190-002	05-Sep-2023 09:34	0089_SD364_230905	✓	✓
EP2312190-003	05-Sep-2023 09:36	0089_QC113_230905	✓	✓
EP2312190-004	05-Sep-2023 10:13	0089_SD363_230905	✓	✓
EP2312190-005	05-Sep-2023 10:50	0089_SD341_230905	✓	✓
EP2312190-006	05-Sep-2023 10:59	0089_SD362_230905	✓	✓
EP2312190-007	05-Sep-2023 11:33	0089_SD340_230905	✓	✓
EP2312190-008	05-Sep-2023 15:17	0089_SD351_230905	✓	✓
EP2312190-009	05-Sep-2023 15:17	0089_SD401_230905	✓	✓
EP2312190-010	05-Sep-2023 15:18	0089_SD381_230905	✓	✓
EP2312190-011	05-Sep-2023 15:18	0089_SD352_230905	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312190**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: 56858	Issue Date	: 14-Sep-2023 14:04
Sampler	: [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD335_230905	0089_SD364_230905	0089_QC113_230905	0089_SD363_230905	0089_SD341_230905
				Sampling date / time	05-Sep-2023 09:27	05-Sep-2023 09:34	05-Sep-2023 09:36	05-Sep-2023 10:13	05-Sep-2023 10:50
Compound	CAS Number	LOR	Unit		EP2312190-001	EP2312190-002	EP2312190-003	EP2312190-004	EP2312190-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**34.3**	**26.2**	**28.8**	**26.8**	**30.9**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD335_230905	0089_SD364_230905	0089_QC113_230905	0089_SD363_230905	0089_SD341_230905
				Sampling date / time	05-Sep-2023 09:27	05-Sep-2023 09:34	05-Sep-2023 09:36	05-Sep-2023 10:13	05-Sep-2023 10:50
Compound	CAS Number	LOR	Unit		EP2312190-001	EP2312190-002	EP2312190-003	EP2312190-004	EP2312190-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**109**	**107**	**115**	**104**	**108**
13C8-PFOA	----	0.0002	%		**92.5**	**99.0**	**97.0**	**102**	**102**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD362_230905	0089_SD340_230905	0089_SD351_230905	0089_SD401_230905	0089_SD381_230905
				Sampling date / time	05-Sep-2023 10:59	05-Sep-2023 11:33	05-Sep-2023 15:17	05-Sep-2023 15:17	05-Sep-2023 15:18
Compound	CAS Number	LOR	Unit		EP2312190-006	EP2312190-007	EP2312190-008	EP2312190-009	EP2312190-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**29.6**	**35.8**	**22.4**	**23.6**	**24.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD362_230905	0089_SD340_230905	0089_SD351_230905	0089_SD401_230905	0089_SD381_230905
				Sampling date / time	05-Sep-2023 10:59	05-Sep-2023 11:33	05-Sep-2023 15:17	05-Sep-2023 15:17	05-Sep-2023 15:18
Compound	CAS Number	LOR	Unit		EP2312190-006	EP2312190-007	EP2312190-008	EP2312190-009	EP2312190-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**114**	**116**	**115**	**114**	**120**
13C8-PFOA	----	0.0002	%		**91.5**	**89.0**	**93.0**	**94.5**	**100**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD352_230905	----	----	----	----
				Sampling date / time	05-Sep-2023 15:18	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312190-011	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**23.9**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD352_230905	----	----	----	----
				Sampling date / time	05-Sep-2023 15:18	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312190-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**110**	----	----	----	----
13C8-PFOA	----	0.0002	%		**96.0**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2312190**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: 56858	Issue Date	: 14-Sep-2023
Sampler	: [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5292628)									
EP2312190-001	0089_SD335_230905	EA055: Moisture Content	----	0.1	%	34.3	35.5	3.6	0% - 20%
EP2312190-011	0089_SD352_230905	EA055: Moisture Content	----	0.1	%	23.9	23.9	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5281119)									
EP2312171-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2312180-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5292089)									
EP2311948-019	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2312431-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5292089) - continued									
EP2312431-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5281119)									
EP2312171-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2312180-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5292089)									
EP2311948-019	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2312431-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5292089) - continued									
EP2312431-002	Anonymous	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5281119)									
EP2312171-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312180-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5292089)									
EP2311948-019	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5292089) - continued									
EP2311948-019	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312431-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5281119)									
EP2312171-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312180-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5292089)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5292089) - continued									
EP2311948-019	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312431-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5281119)									
EP2312171-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2312180-003	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit
EP231P: PFAS Sums (QC Lot: 5292089)									
EP2311948-019	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2312431-002	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5281119)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	116	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	91.5	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	104	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	96.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	102	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5292089)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	95.9	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	73.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	79.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	86.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	76.3	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	90.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5281119)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	106	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	110	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5292089)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.5	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	71.0	131

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5292089) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	114	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5281119)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.7	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5292089)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	73.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	83.8	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	81.6	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.0	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281119)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	103	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	102	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	118	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	98.3	54.8	124

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5292089)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	93.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	97.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	108	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	84.2	54.8	124
EP231P: PFAS Sums (QCLot: 5281119)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5292089)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5281119)							
EP2312171-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	120	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	113	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	104	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	109	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	105	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	111	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5292089)							
EP2312098-026	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	105	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	96.1	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	85.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	91.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	95.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	93.3	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5281119)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5281119) - continued							
EP2312171-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	105	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	97.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	101	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	105	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	114	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	105	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	111	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	113	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	122	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	106	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5292089)							
EP2312098-026	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	99.9	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	88.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	98.0	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	100.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	105	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	96.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	90.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	103	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	93.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	110	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	107	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5281119)							
EP2312171-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	95.6	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	114	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	123	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	114	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	116	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	118	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5292089)							
EP2312098-026	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	81.6	48.0	128

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5292089) - continued							
EP2312098-026	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	92.2	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	87.7	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	109	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	97.3	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	116	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	118	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281119)							
EP2312171-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	106	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	109	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	102	60.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5292089)							
EP2312098-026	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	105	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	118	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	97.1	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312190**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: Stirling SD - JS	Issue Date	: 14-Sep-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 11
Order number	: pfas-omp/Stirling	No. of samples analysed	: 11

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD335_230905, 0089_SD364_230905, 0089_QC113_230905, 0089_SD363_230905, 0089_SD341_230905, 0089_SD362_230905, 0089_SD340_230905, 0089_SD351_230905, 0089_SD401_230905, 0089_SD381_230905, 0089_SD352_230905	**05-Sep-2023**	**----**	----	----	**12-Sep-2023**	19-Sep-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_230905, 0089_SD364_230905, 0089_QC113_230905, 0089_SD363_230905, 0089_SD341_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
HDPE Soil Jar (EP231X)							
0089_SD362_230905, 0089_SD340_230905, 0089_SD351_230905, 0089_SD401_230905, 0089_SD381_230905, 0089_SD352_230905	**05-Sep-2023**	**12-Sep-2023**	03-Mar-2024	✓	**13-Sep-2023**	22-Oct-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_230905, 0089_SD364_230905, 0089_QC113_230905, 0089_SD363_230905, 0089_SD341_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
HDPE Soil Jar (EP231X)							
0089_SD362_230905, 0089_SD340_230905, 0089_SD351_230905, 0089_SD401_230905, 0089_SD381_230905, 0089_SD352_230905	**05-Sep-2023**	**12-Sep-2023**	03-Mar-2024	✓	**13-Sep-2023**	22-Oct-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) 0089_SD335_230905, 0089_SD364_230905, 0089_QC113_230905, 0089_SD363_230905, 0089_SD341_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
HDPE Soil Jar (EP231X) 0089_SD362_230905, 0089_SD340_230905, 0089_SD351_230905, 0089_SD401_230905, 0089_SD381_230905, 0089_SD352_230905	**05-Sep-2023**	**12-Sep-2023**	03-Mar-2024	✓	**13-Sep-2023**	22-Oct-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) 0089_SD335_230905, 0089_SD364_230905, 0089_QC113_230905, 0089_SD363_230905, 0089_SD341_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
HDPE Soil Jar (EP231X) 0089_SD362_230905, 0089_SD340_230905, 0089_SD351_230905, 0089_SD401_230905, 0089_SD381_230905, 0089_SD352_230905	**05-Sep-2023**	**12-Sep-2023**	03-Mar-2024	✓	**13-Sep-2023**	22-Oct-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) 0089_SD335_230905, 0089_SD364_230905, 0089_QC113_230905, 0089_SD363_230905, 0089_SD341_230905	**05-Sep-2023**	**08-Sep-2023**	03-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
HDPE Soil Jar (EP231X) 0089_SD362_230905, 0089_SD340_230905, 0089_SD351_230905, 0089_SD401_230905, 0089_SD381_230905, 0089_SD352_230905	**05-Sep-2023**	**12-Sep-2023**	03-Mar-2024	✓	**13-Sep-2023**	22-Oct-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐PERTH 26 Rigali Way, Wangara WA 6065 Ph: 08 9406 1301 E: samples.perth@alsglobal.com

☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townesville.environmental@alsglobal.com

☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: STANTEC	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE:		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: WA_0089_PFASOMP_23	ALS QUOTE NO.: SY/139/19 B	COC SEQUENCE NUMBER (Circle)	Free Ice / frozen Ice bricks present upon receipt? Yes No N/A
PURCHASE ORDER NUMBER:	COUNTRY OF ORIGIN: AUSTRALIA	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: [redacted]	CONTACT PH:	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY:	RECEIVED BY: [redacted]
COC Emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME:	DATE/TIME: 6/9 8am
Email Reports to: [redacted]		RELINQUISHED BY:	RECEIVED BY:
Email Invoice to: [redacted]		DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	See List													
				TOTAL										

Environmental Division Perth

Work Order Reference EP2312225

Telephone : – 61-8-9406 1301

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

	Monitoring Date	Sample_ID	Sample type
1	4/09/2023	0089_PW378_230904	porewater
2	4/09/2023	0089_QC102_230904	porewater
3	4/09/2023	0089_PW375_230904	porewater
4	4/09/2023	0089_PW374_230904	porewater
5	4/09/2023	0089_MW268_230904	groundwater
6	4/09/2023	0089_MW269_230904	groundwater
7	4/09/2023	0089_MW249_230904	groundwater
8	4/09/2023	0089_QC106_230904	groundwater
9	4/09/2023	0089_MW516_230904	groundwater
10	4/09/2023	0089_MW496_230904	groundwater
11	4/09/2023	0089_MW242_230904	groundwater
12	4/09/2023	0089_MW233_230904	groundwater
13	4/09/2023	0089_MW289_230904	groundwater
14	4/09/2023	0089_MW217_230904	groundwater
15	4/09/2023	0089_MW224_230904	groundwater
16	4/09/2023	0089_MW220_230904	groundwater
17	4/09/2023	0089_MW216_230904	groundwater
18	4/09/2023	0089_PW314_230904	porewater
19	4/09/2023	0089_PW306_230904	porewater
SNR	4/09/2023	0089_MW225_230904	groundwater
20	4/09/2023	0089_MW158_230904	groundwater
21	4/09/2023	0089_MW171_230904	groundwater
22	4/09/2023	0089_MW161_230904	groundwater
23	4/09/2023	0089_QC104_230904	groundwater
24	4/09/2023	0089_MW166_230904	groundwater
25	4/09/2023	0089_MW195D_230904	groundwater
26	4/09/2023	0089_QC105_230904	groundwater
27	4/09/2023	0089_MW173_230904	groundwater
28	4/09/2023	0089_MW193_230904	groundwater
29	4/09/2023	0089_MW226_230904	groundwater
30	4/09/2023	0089_PW409_230904	porewater
31	4/09/2023	0089_PW415_230904	porewater
32	4/09/2023	0089_PW413_230904	porewater
33	4/09/2023	0089_PW411_230904	porewater
34	4/09/2023	0089_QC110_230904	porewater
35	4/09/2023	0089_MW214_230904	groundwater
	4/09/2023	0089_MW215_230904	groundwater
	4/09/2023	0089_PW308_230904	porewater
	4/09/2023	0089_PW316_230904	porewater
	4/09/2023	0089_PW307_230904	porewater
	4/09/2023	0089_PW315_230904	porewater
	4/09/2023	0089_SW317_230904	Surface water
	4/09/2023	0089_QC101_230904	Surface water
	4/09/2023	0089_SD378_230904	Sediment
	4/09/2023	0089_QC103_230904	Sediment
	4/09/2023	0089_SD374_230904	Sediment
	4/09/2023	0089_SD375_230904	Sediment
	4/09/2023	0089_SW318_230904	Surface water
	4/09/2023	0089_SW319_230904	Surface water

	4/09/2023	0089_SW309_230904	Surface water
	4/09/2023	0089_SW310_230904	Surface water
	4/09/2023	0089_SW311_230904	Surface water
	4/09/2023	0089_SD306_230904	Sediment
	4/09/2023	0089_SD314_230904	Sediment
	4/09/2023	0089_SW410_230904	Surface water
	4/09/2023	0089_QC107_230904	Surface water
	4/09/2023	0089_SD409_230904	Sediment
	4/09/2023	0089_QC108_230904	Sediment
	4/09/2023	0089_SW416_230904	Surface water
	4/09/2023	0089_SD415_230904	Sediment
	4/09/2023	0089_SW414_230904	Surface water
	4/09/2023	0089_SD413_230904	Sediment
	4/09/2023	0089_SW412_230904	Surface water
	4/09/2023	0089_QC109_230904	Surface water
	4/09/2023	0089_SD411_230904	Sediment
	4/09/2023	0089_QC111_230904	Sediment
	4/09/2023	0089_SD308_230904	Sediment
	4/09/2023	0089_SD316_230904	Sediment
	4/09/2023	0089_SD307_230904	Sediment
	4/09/2023	0089_SD315_230904	Sediment
	4/09/2023	0089_QC301_230904	water
	4/09/2023	0089_QC302_230904	water
	4/09/2023	0089_QC401_230904	water
	4/09/2023	0089_QC402_230904	water

Comments		WA OMP Water Suite	Rinsate	PFAS Sediments
	1	X		
	2	X		
	3	X		
	4	X		
	5	X		
	6	X		
	7	X		
	8		X	
	9	X		
	10	X		
	11	X		
	12	X		
	13	X		
	14	X		
	15	X		
	16	X		
	17	X		
	18	X		
	19	X		
	SNR		X	
Extra bottles for lab qc	20	X		
	21	X		
	22	X		
	23		X	
	24	X		
	25	X		
	26		X	
Extra bottles for lab QC	27	X		
	28	X		
	29	X		
	30	X		
	31	X		
	32	X		
	33	X		
	34		X	
	35	X		
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		X	

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312225**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 3
Order number	: ----	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 06-Sep-2023 08:00	Issue Date	: 06-Sep-2023
Client Requested Due Date	: 14-Sep-2023	Scheduled Reporting Date	: **13-Sep-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 12.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 35 / 35

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2312225-001	04-Sep-2023 00:00	0089_PW378_230904	✓	✓
EP2312225-002	04-Sep-2023 00:00	0089_QC102_230904	✓	✓
EP2312225-003	04-Sep-2023 00:00	0089_PW375_230904	✓	✓
EP2312225-004	04-Sep-2023 00:00	0089_PW374_230904	✓	✓
EP2312225-005	04-Sep-2023 00:00	0089_MW268_230904	✓	✓
EP2312225-006	04-Sep-2023 00:00	0089_MW269_230904	✓	✓
EP2312225-007	04-Sep-2023 00:00	0089_MW249_230904	✓	✓
EP2312225-008	04-Sep-2023 00:00	0089_QC106_230904	✓	
EP2312225-009	04-Sep-2023 00:00	0089_MW516_230904	✓	✓
EP2312225-010	04-Sep-2023 00:00	0089_MW496_230904	✓	✓
EP2312225-011	04-Sep-2023 00:00	0089_MW242_230904	✓	✓
EP2312225-012	04-Sep-2023 00:00	0089_MW233_230904	✓	✓
EP2312225-013	04-Sep-2023 00:00	0089_MW289_230904	✓	✓
EP2312225-014	04-Sep-2023 00:00	0089_MW217_230904	✓	✓
EP2312225-015	04-Sep-2023 00:00	0089_MW224_230904	✓	✓
EP2312225-016	04-Sep-2023 00:00	0089_MW220_230904	✓	✓
EP2312225-017	04-Sep-2023 00:00	0089_MW216_230904	✓	✓
EP2312225-018	04-Sep-2023 00:00	0089_PW314_230904	✓	✓
EP2312225-019	04-Sep-2023 00:00	0089_PW306_230904	✓	✓
EP2312225-020	04-Sep-2023 00:00	0089_MW158_230904	✓	✓
EP2312225-021	04-Sep-2023 00:00	0089_MW171_230904	✓	✓
EP2312225-022	04-Sep-2023 00:00	0089_MW161_230904	✓	✓
EP2312225-023	04-Sep-2023 00:00	0089_QC104_230904	✓	
EP2312225-024	04-Sep-2023 00:00	0089_MW166_230904	✓	✓
EP2312225-025	04-Sep-2023 00:00	0089_MW195D_230904	✓	✓
EP2312225-026	04-Sep-2023 00:00	0089_QC105_230904	✓	
EP2312225-027	04-Sep-2023 00:00	0089_MW173_230904	✓	✓
EP2312225-028	04-Sep-2023 00:00	0089_MW193_230904	✓	✓
EP2312225-029	04-Sep-2023 00:00	0089_MW226_230904	✓	✓
EP2312225-030	04-Sep-2023 00:00	0089_PW409_230904	✓	✓
EP2312225-031	04-Sep-2023 00:00	0089_PW415_230904	✓	✓
EP2312225-032	04-Sep-2023 00:00	0089_PW413_230904	✓	✓
EP2312225-033	04-Sep-2023 00:00	0089_PW411_230904	✓	✓
EP2312225-034	04-Sep-2023 00:00	0089_QC110_230904	✓	
EP2312225-035	04-Sep-2023 00:00	0089_MW214_230904	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]stantec.com
DERP LAB REPORTS		
- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312225**	Page	: 1 of 24
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 08:00
Order number	: ----	Date Analysis Commenced	: 06-Sep-2023
C-O-C number	: ----	Issue Date	: 15-Sep-2023 18:10
Sampler	: ----		
Site	: ----		
Quote number	: SY/139/19 B		
No. of samples received	: 35		
No. of samples analysed	: 35		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits for sample #13 due to analytes not quantified in this report. Major anions (ED041G/ED045G) have been confirmed by re-analysis. Insufficient sample volume to confirm major cations and alkalinity.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW378_230904	0089_QC102_230904	0089_PW375_230904	0089_PW374_230904	0089_MW268_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-001	EP2312225-002	EP2312225-003	EP2312225-004	EP2312225-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		151	131	121	120	440
Total Alkalinity as CaCO3	----	1	mg/L		151	131	121	120	440
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2600	2500	2470	2660	563
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19300	19300	19200	19300	656
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		430	429	425	436	162
Magnesium	7439-95-4	1	mg/L		1410	1410	1390	1420	151
Sodium	7440-23-5	1	mg/L		10600	10600	10600	10700	415
Potassium	7440-09-7	1	mg/L		512	513	509	515	27
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		602	599	595	602	39.0
ø Total Cations	----	0.01	meq/L		612	612	610	617	39.2
ø Ionic Balance	----	0.01	%		0.83	1.04	1.18	1.23	0.30
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	0.09
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	0.09
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	0.32
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	0.02	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	0.06

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW378_230904	0089_QC102_230904	0089_PW375_230904	0089_PW374_230904	0089_MW268_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-001	EP2312225-002	EP2312225-003	EP2312225-004	EP2312225-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW378_230904	0089_QC102_230904	0089_PW375_230904	0089_PW374_230904	0089_MW268_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-001	EP2312225-002	EP2312225-003	EP2312225-004	EP2312225-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.02**	**0.56**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.02**	**0.32**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.02**	**0.47**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.8**	**95.0**	**90.7**	**92.9**	**97.3**
13C8-PFOA	----	0.02	%		**99.2**	**96.3**	**95.9**	**92.2**	**95.4**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_230904	0089_MW249_230904	0089_QC106_230904	0089_MW516_230904	0089_MW496_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-006	EP2312225-007	EP2312225-008	EP2312225-009	EP2312225-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**456**	**464**	----	**517**	**375**
Total Alkalinity as CaCO3	----	1	mg/L		**456**	**464**	----	**517**	**375**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**79**	**58**	----	**11**	**92**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**279**	**156**	----	**92**	**194**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**69**	**101**	----	**103**	**65**
Magnesium	7439-95-4	1	mg/L		**60**	**42**	----	**42**	**38**
Sodium	7440-23-5	1	mg/L		**164**	**99**	----	**74**	**142**
Potassium	7440-09-7	1	mg/L		**14**	**5**	----	**10**	**12**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**18.6**	**14.9**	----	**13.2**	**14.9**
ø Total Cations	----	0.01	meq/L		**15.9**	**12.9**	----	**12.1**	**12.8**
ø Ionic Balance	----	0.01	%		**7.98**	**7.00**	----	**4.29**	**7.30**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.05**	<0.02	<0.02	<0.02	**0.04**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.07**	<0.02	<0.02	**0.02**	**0.06**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.31**	**0.25**	**0.25**	**0.51**	**0.99**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	**0.08**	**0.09**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.31**	**0.11**	**0.11**	**4.80**	**7.52**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	**0.03**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.08**	<0.02	<0.02	**0.08**	**0.16**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_230904	0089_MW249_230904	0089_QC106_230904	0089_MW516_230904	0089_MW496_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-006	EP2312225-007	EP2312225-008	EP2312225-009	EP2312225-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.03**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.01**	<0.01	<0.01	**0.06**	**0.10**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_230904	0089_MW249_230904	0089_QC106_230904	0089_MW516_230904	0089_MW496_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-006	EP2312225-007	EP2312225-008	EP2312225-009	EP2312225-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.83**	**0.36**	**0.36**	**5.58**	**8.99**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.62**	**0.36**	**0.36**	**5.31**	**8.51**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.76**	**0.36**	**0.36**	**5.48**	**8.84**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.7**	**93.1**	**93.1**	**94.1**	**96.4**
13C8-PFOA	----	0.02	%		**98.8**	**93.0**	**94.6**	**96.2**	**96.5**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW242_230904	0089_MW233_230904	0089_MW289_230904	0089_MW217_230904	0089_MW224_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-011	EP2312225-012	EP2312225-013	EP2312225-014	EP2312225-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		184	114	528	293	288
Total Alkalinity as CaCO3	----	1	mg/L		184	114	528	293	288
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		23	7	44	29	38
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18	16	52	34	101
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		57	29	86	93	64
Magnesium	7439-95-4	1	mg/L		10	4	23	12	22
Sodium	7440-23-5	1	mg/L		11	13	62	28	82
Potassium	7440-09-7	1	mg/L		1	2	6	7	3
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		4.66	2.87	12.9	7.42	9.39
ø Total Cations	----	0.01	meq/L		4.17	2.39	9.03	7.02	8.65
ø Ionic Balance	----	0.01	%		5.56	9.15	17.7	2.71	4.14
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	0.03	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	0.04	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.02	0.32	0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.04	0.03	1.16	0.03	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	1.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	5.14	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	0.04	4.86	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW242_230904	0089_MW233_230904	0089_MW289_230904	0089_MW217_230904	0089_MW224_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-011	EP2312225-012	EP2312225-013	EP2312225-014	EP2312225-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	**0.72**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.02**	**0.33**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	**0.02**	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	**18.8**	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	**0.30**	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW242_230904	0089_MW233_230904	0089_MW289_230904	0089_MW217_230904	0089_MW224_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-011	EP2312225-012	EP2312225-013	EP2312225-014	EP2312225-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.04**	**0.05**	**1.63**	**31.3**	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.04**	**0.05**	**1.48**	**0.04**	**0.02**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.04**	**0.05**	**1.57**	**31.3**	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.1**	**96.5**	**101**	**90.9**	**91.3**
13C8-PFOA	----	0.02	%		**97.2**	**97.2**	**97.0**	**90.7**	**94.0**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW220_230904	0089_MW216_230904	0089_PW314_230904	0089_PW306_230904	0089_MW158_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-016	EP2312225-017	EP2312225-018	EP2312225-019	EP2312225-020
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**263**	**314**	**123**	**120**	**434**
Total Alkalinity as CaCO3	----	1	mg/L		**263**	**314**	**123**	**120**	**434**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**20**	**178**	**2650**	**2620**	**483**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**64**	**642**	**19500**	**19400**	**4680**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**80**	**136**	**440**	**432**	**185**
Magnesium	7439-95-4	1	mg/L		**12**	**49**	**1450**	**1430**	**330**
Sodium	7440-23-5	1	mg/L		**32**	**334**	**10900**	**10700**	**2390**
Potassium	7440-09-7	1	mg/L		**7**	**11**	**524**	**515**	**104**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**7.48**	**28.1**	**608**	**604**	**151**
ø Total Cations	----	0.01	meq/L		**6.55**	**25.6**	**629**	**618**	**143**
ø Ionic Balance	----	0.01	%		**6.60**	**4.58**	**1.71**	**1.12**	**2.63**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.03**	**0.13**	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.02**	**0.14**	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.32**	**1.53**	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.06**	**0.06**	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**4.86**	**0.33**	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**2.9**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.08**	**8.08**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.12**	**7.26**	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW220_230904	0089_MW216_230904	0089_PW314_230904	0089_PW306_230904	0089_MW158_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-016	EP2312225-017	EP2312225-018	EP2312225-019	EP2312225-020
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.04**	**0.78**	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.05**	**0.16**	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	**1.23**	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW220_230904	0089_MW216_230904	0089_PW314_230904	0089_PW306_230904	0089_MW158_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-016	EP2312225-017	EP2312225-018	EP2312225-019	EP2312225-020
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**5.58**	**22.6**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**5.18**	**1.86**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**5.50**	**22.4**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.1**	**95.4**	**88.5**	**91.5**	**93.9**
13C8-PFOA	----	0.02	%		**93.3**	**104**	**100**	**89.8**	**87.7**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW171_230904	0089_MW161_230904	0089_QC104_230904	0089_MW166_230904	0089_MW195D_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-021	EP2312225-022	EP2312225-023	EP2312225-024	EP2312225-025
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		498	376	----	388	319
Total Alkalinity as CaCO3	----	1	mg/L		498	376	----	388	319
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		282	246	----	167	1300
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1670	669	----	909	7890
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		101	82	----	110	316
Magnesium	7439-95-4	1	mg/L		175	66	----	97	639
Sodium	7440-23-5	1	mg/L		1020	421	----	480	4310
Potassium	7440-09-7	1	mg/L		58	35	----	40	222
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		62.9	31.5	----	36.9	256
ø Total Cations	----	0.01	meq/L		65.3	28.7	----	35.4	262
ø Ionic Balance	----	0.01	%		1.84	4.61	----	2.07	1.06
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		1.00	<0.02	<0.02	0.06	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.59	0.02	<0.02	0.03	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		4.93	0.26	0.25	0.63	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.87	0.03	0.03	0.14	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.87	2.63	2.71	3.91	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		0.5	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.43	0.06	0.06	0.24	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		1.55	0.09	0.10	0.25	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW171_230904	0089_MW161_230904	0089_QC104_230904	0089_MW166_230904	0089_MW195D_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
					EP2312225-021	EP2312225-022	EP2312225-023	EP2312225-024	EP2312225-025
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.13**	**0.04**	**0.04**	**0.14**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.25**	**0.03**	**0.03**	**0.09**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW171_230904	0089_MW161_230904	0089_QC104_230904	0089_MW166_230904	0089_MW195D_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-021	EP2312225-022	EP2312225-023	EP2312225-024	EP2312225-025
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**11.1**	**3.16**	**3.22**	**5.49**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**5.80**	**2.89**	**2.96**	**4.54**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**9.66**	**3.11**	**3.19**	**5.32**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**85.0**	**96.5**	**104**	**96.4**	**95.2**
13C8-PFOA	----	0.02	%		**88.1**	**96.6**	**90.8**	**98.7**	**92.9**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC105_230904	0089_MW173_230904	0089_MW193_230904	0089_MW226_230904	0089_PW409_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-026	EP2312225-027	EP2312225-028	EP2312225-029	EP2312225-030
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	485	410	623	127
Total Alkalinity as CaCO3	----	1	mg/L		----	485	410	623	127
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	58	120	2150	2420
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	729	380	14200	17900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	138	112	409	420
Magnesium	7439-95-4	1	mg/L		----	87	55	1110	1380
Sodium	7440-23-5	1	mg/L		----	351	188	7960	10300
Potassium	7440-09-7	1	mg/L		----	22	10	495	505
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		----	31.5	21.4	458	558
ø Total Cations	----	0.01	meq/L		----	29.9	18.5	471	595
ø Ionic Balance	----	0.01	%		----	2.58	7.16	1.39	3.26
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.12	0.16	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.08	0.26	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	1.67	2.25	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.33	0.16	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	2.60	1.34	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	0.06	0.06	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	0.23	0.40	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC105_230904	0089_MW173_230904	0089_MW193_230904	0089_MW226_230904	0089_PW409_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-026	EP2312225-027	EP2312225-028	EP2312225-029	EP2312225-030
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.04**	**0.05**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.15**	**0.16**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC105_230904	0089_MW173_230904	0089_MW193_230904	0089_MW226_230904	0089_PW409_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-026	EP2312225-027	EP2312225-028	EP2312225-029	EP2312225-030
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**5.28**	**4.84**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**4.27**	**3.59**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**4.87**	**4.42**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**91.0**	**92.7**	**91.7**	**94.4**	**92.6**
13C8-PFOA	----	0.02	%		**92.8**	**91.8**	**98.0**	**90.3**	**92.8**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW415_230904	0089_PW413_230904	0089_PW411_230904	0089_QC110_230904	0089_MW214_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-031	EP2312225-032	EP2312225-033	EP2312225-034	EP2312225-035
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**122**	**133**	**124**	----	**382**
Total Alkalinity as CaCO3	----	1	mg/L		**122**	**133**	**124**	----	**382**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2500**	**2840**	**2560**	----	**37**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18200**	**18600**	**19000**	----	**607**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**432**	**441**	**434**	----	**157**
Magnesium	7439-95-4	1	mg/L		**1440**	**1440**	**1440**	----	**41**
Sodium	7440-23-5	1	mg/L		**10700**	**10800**	**10700**	----	**260**
Potassium	7440-09-7	1	mg/L		**519**	**522**	**517**	----	**6**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**568**	**586**	**592**	----	**25.5**
ø Total Cations	----	0.01	meq/L		**619**	**624**	**619**	----	**22.7**
ø Ionic Balance	----	0.01	%		**4.29**	**3.07**	**2.24**	----	**5.92**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW415_230904	0089_PW413_230904	0089_PW411_230904	0089_QC110_230904	0089_MW214_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-031	EP2312225-032	EP2312225-033	EP2312225-034	EP2312225-035
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW415_230904	0089_PW413_230904	0089_PW411_230904	0089_QC110_230904	0089_MW214_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312225-031	EP2312225-032	EP2312225-033	EP2312225-034	EP2312225-035
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.1**	**91.1**	**99.4**	**93.4**	**86.1**
13C8-PFOA	----	0.02	%		**88.8**	**105**	**91.4**	**96.7**	**93.2**

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	***Low***	***High***
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2312225**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: ----	Date Analysis Commenced	: 06-Sep-2023
C-O-C number	: ----	Issue Date	: 15-Sep-2023
Sampler	: ----		
Site	: ----		
Quote number	: SY/139/19 B		
No. of samples received	: 35		
No. of samples analysed	: 35		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5285737)									
EP2312225-002	0089_QC102_230904	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	131	128	2.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	131	128	2.5	0% - 20%
EP2312225-013	0089_MW289_230904	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	528	525	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	528	525	0.5	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5286328)									
EP2312154-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	163	162	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	163	162	0.8	0% - 20%
EP2312154-008	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	520	520	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	520	520	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5281169)									
EP2312225-001	0089_PW378_230904	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2600	2520	3.1	0% - 20%
EP2312225-012	0089_MW233_230904	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	7	7	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5281174)									
EP2312225-022	0089_MW161_230904	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	246	252	2.4	0% - 20%
EP2312225-035	0089_MW214_230904	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	37	42	13.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 5281170)									
EP2312225-001	0089_PW378_230904	ED045G: Chloride	16887-00-6	1	mg/L	19300	19300	0.1	0% - 20%
EP2312225-012	0089_MW233_230904	ED045G: Chloride	16887-00-6	1	mg/L	16	15	0.0	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 5281173)									
EP2312225-022	0089_MW161_230904	ED045G: Chloride	16887-00-6	1	mg/L	669	668	0.2	0% - 20%
EP2312225-035	0089_MW214_230904	ED045G: Chloride	16887-00-6	1	mg/L	607	670	9.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5283122)									
EP2312225-001	0089_PW378_230904	ED093F: Calcium	7440-70-2	1	mg/L	430	443	2.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1410	1460	3.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10600	11000	3.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	512	525	2.5	0% - 20%
EP2312225-012	0089_MW233_230904	ED093F: Calcium	7440-70-2	1	mg/L	29	29	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	4	4	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	13	14	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5283123)									
EP2312225-022	0089_MW161_230904	ED093F: Calcium	7440-70-2	1	mg/L	82	83	1.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	66	67	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	421	420	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	35	35	0.0	0% - 20%
EP2312225-035	0089_MW214_230904	ED093F: Calcium	7440-70-2	1	mg/L	157	154	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	41	40	2.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	260	254	2.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5280990)									
EP2312225-020	0089_MW158_230904	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.06	105	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5280992)									
EP2312228-014	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5280990)									
EP2312225-020	0089_MW158_230904	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5280990) - continued									
EP2312225-020	0089_MW158_230904	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5280992)									
EP2312228-014	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5280990)									
EP2312225-020	0089_MW158_230904	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5280992)									
EP2312228-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5280992) - continued									
EP2312228-014	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5280990)									
EP2312225-020	0089_MW158_230904	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5280992)									
EP2312228-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5280990)									
EP2312225-020	0089_MW158_230904	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	0.06	143	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	0.06	143	No Limit
EP231P: PFAS Sums (QC Lot: 5280992)									
EP2312228-014	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5285737)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	96.5	91.2	110
				<1	200 mg/L	97.6	91.2	110
ED037P: Alkalinity by PC Titrator (QCLot: 5286328)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	108	91.2	110
				<1	200 mg/L	106	91.2	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281169)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.1	89.9	112
				<1	500 mg/L	94.3	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281174)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.1	89.9	112
				<1	500 mg/L	96.9	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5281170)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.0	88.6	113
				<1	1000 mg/L	97.0	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 5281173)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	107	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5283122)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.2	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5283123)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 5283123) - continued								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	105	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5280986)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.5	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	106	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	86.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	93.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	77.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	90.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5280990)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	109	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	98.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	84.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	93.9	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	87.5	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	96.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5280992)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	90.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	91.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	103	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	90.7	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5280986)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	99.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	103	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.2	69.0	133

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5280986) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	96.8	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5280990)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	93.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	97.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5280992)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	99.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	91.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	91.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	83.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	95.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5280986)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	99.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	106	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	104	62.2	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5280986) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	88.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5280990)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	101	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	85.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.1	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	105	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	95.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	94.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5280992)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	91.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	85.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	97.5	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	94.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	93.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	79.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5280986)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	100	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	103	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	108	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	101	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5280990)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	103	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	107	67.0	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5280990) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	85.7	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5280992)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	98.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	97.7	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	90.0	64.2	133
EP231P: PFAS Sums (QCLot: 5280986)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5280990)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5280992)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281169)							
EP2312225-001	0089_PW378_230904	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281174)							
EP2312225-022	0089_MW161_230904	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	122	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5281170)							
EP2312225-001	0089_PW378_230904						

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED045G: Chloride by Discrete Analyser (QCLot: 5281170) - continued							
EP2312225-001	0089_PW378_230904	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5281173)							
EP2312225-022	0089_MW161_230904	ED045G: Chloride	16887-00-6	1000 mg/L	108	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5280992)							
EP2312225-027	0089_MW173_230904	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.6	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	86.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	94.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	97.5	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5280992)							
EP2312225-027	0089_MW173_230904	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	88.6	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	76.9	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	90.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	88.6	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	89.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	96.4	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	93.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	87.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	104	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	101	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5280992)							
EP2312225-027	0089_MW173_230904	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	98.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	88.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	87.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	95.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	100	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	109	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	88.6	61.0	135

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5280992)							
EP2312225-027	0089_MW173_230904	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	96.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	95.9	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	93.1	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.5	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312225**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: ----	Issue Date	: 15-Sep-2023
Sampler	: ----	No. of samples received	: 35
Order number	: ----	No. of samples analysed	: 35

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2312225--001	0089_PW378_230904	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2312225--001	0089_PW378_230904	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2312225--027	0089_MW173_230904	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2312225--027	0089_MW173_230904	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
0089_PW378_230904, 0089_QC102_230904, 0089_PW375_230904, 0089_PW374_230904, 0089_MW268_230904, 0089_MW269_230904, 0089_MW249_230904, 0089_MW516_230904, 0089_MW496_230904, 0089_MW242_230904, 0089_MW233_230904, 0089_MW289_230904, 0089_MW217_230904, 0089_MW224_230904, 0089_MW220_230904, 0089_MW216_230904, 0089_PW314_230904, 0089_PW306_230904, 0089_MW158_230904, 0089_MW171_230904, 0089_MW161_230904, 0089_MW166_230904, 0089_MW195D_230904, 0089_MW173_230904, 0089_MW193_230904, 0089_MW226_230904, 0089_PW409_230904, 0089_PW415_230904, 0089_PW413_230904, 0089_PW411_230904, 0089_MW214_230904	----	----	----	13-Sep-2023	11-Sep-2023	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	51	3.92	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	51	1.96	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) 0089_PW378_230904, 0089_QC102_230904, 0089_PW375_230904, 0089_PW374_230904, 0089_MW268_230904, 0089_MW269_230904, 0089_MW249_230904, 0089_MW516_230904, 0089_MW496_230904, 0089_MW242_230904, 0089_MW233_230904, 0089_MW289_230904, 0089_MW217_230904, 0089_MW224_230904, 0089_MW220_230904, 0089_MW216_230904, 0089_PW314_230904, 0089_PW306_230904, 0089_MW158_230904, 0089_MW171_230904	**04-Sep-2023**	**----**	----	**----**	**08-Sep-2023**	18-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) 0089_MW161_230904, 0089_MW166_230904, 0089_MW195D_230904, 0089_MW173_230904, 0089_MW193_230904, 0089_MW226_230904, 0089_PW409_230904, 0089_PW415_230904, 0089_PW413_230904, 0089_PW411_230904, 0089_MW214_230904	**04-Sep-2023**	**----**	----	**----**	**09-Sep-2023**	18-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW378_230904, 0089_QC102_230904, 0089_PW375_230904, 0089_PW374_230904, 0089_MW268_230904, 0089_MW269_230904, 0089_MW249_230904, 0089_MW516_230904, 0089_MW496_230904, 0089_MW242_230904, 0089_MW233_230904, 0089_MW289_230904, 0089_MW217_230904, 0089_MW224_230904, 0089_MW220_230904, 0089_MW216_230904, 0089_PW314_230904, 0089_PW306_230904, 0089_MW158_230904, 0089_MW171_230904, 0089_MW161_230904, 0089_MW166_230904, 0089_MW195D_230904, 0089_MW173_230904, 0089_MW193_230904, 0089_MW226_230904, 0089_PW409_230904, 0089_PW415_230904, 0089_PW413_230904, 0089_PW411_230904, 0089_MW214_230904	**04-Sep-2023**	**----**	----	**----**	**14-Sep-2023**	02-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW378_230904, 0089_QC102_230904, 0089_PW375_230904, 0089_PW374_230904, 0089_MW268_230904, 0089_MW269_230904, 0089_MW249_230904, 0089_MW516_230904, 0089_MW496_230904, 0089_MW242_230904, 0089_MW233_230904, 0089_MW289_230904, 0089_MW217_230904, 0089_MW224_230904, 0089_MW220_230904, 0089_MW216_230904, 0089_PW314_230904, 0089_PW306_230904, 0089_MW158_230904, 0089_MW171_230904, 0089_MW161_230904, 0089_MW166_230904, 0089_MW195D_230904, 0089_MW173_230904, 0089_MW193_230904, 0089_MW226_230904, 0089_PW409_230904, 0089_PW415_230904, 0089_PW413_230904, 0089_PW411_230904, 0089_MW214_230904	**04-Sep-2023**	**----**	----	**----**	**14-Sep-2023**	02-Oct-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW378_230904, 0089_QC102_230904, 0089_PW375_230904, 0089_PW374_230904, 0089_MW268_230904, 0089_MW269_230904, 0089_MW249_230904, 0089_MW516_230904, 0089_MW496_230904, 0089_MW242_230904, 0089_MW233_230904, 0089_MW289_230904, 0089_MW217_230904, 0089_MW224_230904, 0089_MW220_230904, 0089_MW216_230904, 0089_PW314_230904, 0089_PW306_230904, 0089_MW158_230904, 0089_MW171_230904, 0089_MW161_230904, 0089_MW166_230904, 0089_MW195D_230904, 0089_MW173_230904, 0089_MW193_230904, 0089_MW226_230904, 0089_PW409_230904, 0089_PW415_230904, 0089_PW413_230904, 0089_PW411_230904, 0089_MW214_230904	**04-Sep-2023**	**----**	----	**----**	**13-Sep-2023**	11-Sep-2023	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW374_230904, 0089_MW233_230904, 0089_MW217_230904, 0089_MW224_230904, 0089_MW171_230904, 0089_MW195D_230904, 0089_QC105_230904, 0089_MW173_230904, 0089_PW409_230904, 0089_PW415_230904, 0089_PW413_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**06-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X)							
0089_PW378_230904, 0089_QC102_230904, 0089_PW375_230904, 0089_MW268_230904, 0089_MW269_230904, 0089_MW249_230904, 0089_QC106_230904, 0089_MW516_230904, 0089_MW496_230904, 0089_MW242_230904, 0089_MW289_230904, 0089_MW220_230904, 0089_MW216_230904, 0089_PW314_230904, 0089_PW306_230904, 0089_MW158_230904, 0089_MW161_230904, 0089_QC104_230904, 0089_MW166_230904, 0089_MW193_230904, 0089_MW226_230904, 0089_PW411_230904, 0089_QC110_230904, 0089_MW214_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**07-Sep-2023**	02-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW374_230904, 0089_MW233_230904, 0089_MW217_230904, 0089_MW224_230904, 0089_MW171_230904, 0089_MW195D_230904, 0089_QC105_230904, 0089_MW173_230904, 0089_PW409_230904, 0089_PW415_230904, 0089_PW413_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**06-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X)							
0089_PW378_230904, 0089_QC102_230904, 0089_PW375_230904, 0089_MW268_230904, 0089_MW269_230904, 0089_MW249_230904, 0089_QC106_230904, 0089_MW516_230904, 0089_MW496_230904, 0089_MW242_230904, 0089_MW289_230904, 0089_MW220_230904, 0089_MW216_230904, 0089_PW314_230904, 0089_PW306_230904, 0089_MW158_230904, 0089_MW161_230904, 0089_QC104_230904, 0089_MW166_230904, 0089_MW193_230904, 0089_MW226_230904, 0089_PW411_230904, 0089_QC110_230904, 0089_MW214_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**07-Sep-2023**	02-Mar-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW374_230904, 0089_MW233_230904, 0089_MW217_230904, 0089_MW224_230904, 0089_MW171_230904, 0089_MW195D_230904, 0089_QC105_230904, 0089_MW173_230904, 0089_PW409_230904, 0089_PW415_230904, 0089_PW413_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**06-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X)							
0089_PW378_230904, 0089_QC102_230904, 0089_PW375_230904, 0089_MW268_230904, 0089_MW269_230904, 0089_MW249_230904, 0089_QC106_230904, 0089_MW516_230904, 0089_MW496_230904, 0089_MW242_230904, 0089_MW289_230904, 0089_MW220_230904, 0089_MW216_230904, 0089_PW314_230904, 0089_PW306_230904, 0089_MW158_230904, 0089_MW161_230904, 0089_QC104_230904, 0089_MW166_230904, 0089_MW193_230904, 0089_MW226_230904, 0089_PW411_230904, 0089_QC110_230904, 0089_MW214_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**07-Sep-2023**	02-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_PW374_230904, 0089_MW233_230904, 0089_MW217_230904, 0089_MW224_230904, 0089_MW171_230904, 0089_MW195D_230904, 0089_QC105_230904, 0089_MW173_230904, 0089_PW409_230904, 0089_PW415_230904, 0089_PW413_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**06-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW378_230904, 0089_QC102_230904, 0089_PW375_230904, 0089_MW268_230904, 0089_MW269_230904, 0089_MW249_230904, 0089_QC106_230904, 0089_MW516_230904, 0089_MW496_230904, 0089_MW242_230904, 0089_MW289_230904, 0089_MW220_230904, 0089_MW216_230904, 0089_PW314_230904, 0089_PW306_230904, 0089_MW158_230904, 0089_MW161_230904, 0089_QC104_230904, 0089_MW166_230904, 0089_MW193_230904, 0089_MW226_230904, 0089_PW411_230904, 0089_QC110_230904, 0089_MW214_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**07-Sep-2023**	02-Mar-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_PW374_230904, 0089_MW233_230904, 0089_MW217_230904, 0089_MW224_230904, 0089_MW171_230904, 0089_MW195D_230904, 0089_QC105_230904, 0089_MW173_230904, 0089_PW409_230904, 0089_PW415_230904, 0089_PW413_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**06-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW378_230904, 0089_QC102_230904, 0089_PW375_230904, 0089_MW268_230904, 0089_MW269_230904, 0089_MW249_230904, 0089_QC106_230904, 0089_MW516_230904, 0089_MW496_230904, 0089_MW242_230904, 0089_MW289_230904, 0089_MW220_230904, 0089_MW216_230904, 0089_PW314_230904, 0089_PW306_230904, 0089_MW158_230904, 0089_MW161_230904, 0089_QC104_230904, 0089_MW166_230904, 0089_MW193_230904, 0089_MW226_230904, 0089_PW411_230904, 0089_QC110_230904, 0089_MW214_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**07-Sep-2023**	02-Mar-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	31	**12.90**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	51	**3.92**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	31	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	51	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	31	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	51	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	51	**1.96**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com

☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

☐NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com

☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com

☐PERTH 26 Rigali Way, Wangara WA 6065 Ph: 08 9406 1301 E: samples.perth@alsglobal.com

☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: STANTEC	**TURNAROUND REQUIREMENTS :** ☐ Standard TAT (List due date):		**FOR LABORATORY USE ONLY (Circle)**
OFFICE:	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):		Custody Seal Intact? Yes No N/A
PROJECT: WA_0089_PFASOMP_23	**ALS QUOTE NO.: SY/139/19 B**	**COC SEQUENCE NUMBER (Circle)**	Free Ice / frozen ice bricks present upon receipt? Yes No N/A
PURCHASE ORDER NUMBER:	**COUNTRY OF ORIGIN: AUSTRALIA**	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER [redacted]	**CONTACT PH:**	OF: 1 2 [redacted] 5 6 7	Other comment:

SAMPLER:	**SAMPLER MOBILE:**	**RELINQUISHED BY:**	**RECEIVED BY** [redacted]	**RELINQUISHED BY:**	**RECEIVED BY:**
COC Emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**				
Email Reports to: [redacted]		**DATE/TIME:**	**DATE/TIME:** 6/9 8am	**DATE/TIME:**	**DATE/TIME:**
Email Invoice to: [redacted]					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL BOTTLES									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1-38	See List													
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plasti
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

Environmental Division
Perth
Work Order Reference
EP2312228

Telephone : – 61-8-9406 1301

	Monitoring Date	Sample_ID	Sample type
	4/09/2023	0089_PW378_230904	porewater
	4/09/2023	0089_QC102_230904	porewater
	4/09/2023	0089_PW375_230904	porewater
	4/09/2023	0089_PW374_230904	porewater
	4/09/2023	0089_MW268_230904	groundwater
	4/09/2023	0089_MW269_230904	groundwater
	4/09/2023	0089_MW249_230904	groundwater
	4/09/2023	0089_QC106_230904	groundwater
	4/09/2023	0089_MW516_230904	groundwater
	4/09/2023	0089_MW496_230904	groundwater
	4/09/2023	0089_MW242_230904	groundwater
	4/09/2023	0089_MW233_230904	groundwater
	4/09/2023	0089_MW289_230904	groundwater
	4/09/2023	0089_MW217_230904	groundwater
	4/09/2023	0089_MW224_230904	groundwater
	4/09/2023	0089_MW220_230904	groundwater
	4/09/2023	0089_MW216_230904	groundwater
	4/09/2023	0089_PW314_230904	porewater
	4/09/2023	0089_PW306_230904	porewater
	4/09/2023	0089_MW225_230904	groundwater
	4/09/2023	0089_MW158_230904	groundwater
	4/09/2023	0089_MW171_230904	groundwater
	4/09/2023	0089_MW161_230904	groundwater
	4/09/2023	0089_QC104_230904	groundwater
	4/09/2023	0089_MW166_230904	groundwater
	4/09/2023	0089_MW195D_230904	groundwater
	4/09/2023	0089_QC105_230904	groundwater
	4/09/2023	0089_MW173_230904	groundwater
	4/09/2023	0089_MW193_230904	groundwater
	4/09/2023	0089_MW226_230904	groundwater
	4/09/2023	0089_PW409_230904	porewater
	4/09/2023	0089_PW415_230904	porewater
	4/09/2023	0089_PW413_230904	porewater
	4/09/2023	0089_PW411_230904	porewater
	4/09/2023	0089_QC110_230904	porewater
	4/09/2023	0089_MW214_230904	groundwater
1	4/09/2023	0089_MW215_230904	groundwater
2	4/09/2023	0089_PW308_230904	porewater
3	4/09/2023	0089_PW316_230904	porewater
4	4/09/2023	0089_PW307_230904	porewater
5	4/09/2023	0089_PW315_230904	porewater
6	4/09/2023	0089_SW317_230904	Surface water
7	4/09/2023	0089_QC101_230904	Surface water
8	4/09/2023	0089_SD378_230904	Sediment
9	4/09/2023	0089_QC103_230904	Sediment
10	4/09/2023	0089_SD374_230904	Sediment
11	4/09/2023	0089_SD375_230904	Sediment
12	4/09/2023	0089_SW318_230904	Surface water
13	4/09/2023	0089_SW319_230904	Surface water

14	4/09/2023	0089_SW309_230904	Surface water
15	4/09/2023	0089_SW310_230904	Surface water
16	4/09/2023	0089_SW311_230904	Surface water
17	4/09/2023	0089_SD306_230904	Sediment
18	4/09/2023	0089_SD314_230904	Sediment
19	4/09/2023	0089_SW410_230904	Surface water
20	4/09/2023	0089_QC107_230904	Surface water
21	4/09/2023	0089_SD409_230904	Sediment
22	4/09/2023	0089_QC108_230904	Sediment
23	4/09/2023	0089_SW416_230904	Surface water
24	4/09/2023	0089_SD415_230904	Sediment
25	4/09/2023	0089_SW414_230904	Surface water
26	4/09/2023	0089_SD413_230904	Sediment
27	4/09/2023	0089_SW412_230904	Surface water
28	4/09/2023	0089_QC109_230904	Surface water
29	4/09/2023	0089_SD411_230904	Sediment
30	4/09/2023	0089_QC111_230904	Sediment
31	4/09/2023	0089_SD308_230904	Sediment
32	4/09/2023	0089_SD316_230904	Sediment
33	4/09/2023	0089_SD307_230904	Sediment
34	4/09/2023	0089_SD315_230904	Sediment
35	4/09/2023	0089_QC301_230904	water
36	4/09/2023	0089_QC302_230904	water
37	4/09/2023	0089_QC401_230904	water
38	4/09/2023	0089_QC402_230904	water

Comments	WA OMP Water Suite	Rinsate	PFAS Sediments
	X		
	X		
	X		
	X		
	X		
	X		
	X		
		X	
	X		
	X		
	X		
	X		
	X		
	X		
	X		
	X		
	X		
	X		
		X	
Extra bottles for lab qc	X		
	X		
	X		
		X	
	X		
	X		
		X	
Extra bottles for lab QC	X		
	X		
	X		
	X		
	X		
	X		
	X		
		X	
	X		
1	X		
2	X		
3	X		
4	X		
5	X		
6	X		
7		X	
8			X
9			X
10			X
11			X
12	X		
13	X		

14	X		
15	X		
16	X		
17			X
18			X
19	X		
20		X	
21			X
22			X
23	X		
24			X
25	X		
26			X
27	X		
28		X	
29			X
30			X
31			X
32			X
33			X
34			X
35		X	
36		X	
37		X	
38		X	

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312228**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 3
Order number	: ----	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 06-Sep-2023 08:00	Issue Date	: 06-Sep-2023
Client Requested Due Date	: 14-Sep-2023	Scheduled Reporting Date	: **13-Sep-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 12.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 38 / 38

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2312228-008	04-Sep-2023 00:00	0089_SD378_230904	✓	✓
EP2312228-009	04-Sep-2023 00:00	0089_QC103_230904	✓	✓
EP2312228-010	04-Sep-2023 00:00	0089_SD374_230904	✓	✓
EP2312228-011	04-Sep-2023 00:00	0089_SD375_230904	✓	✓
EP2312228-017	04-Sep-2023 00:00	0089_SD306_230904	✓	✓
EP2312228-018	04-Sep-2023 00:00	0089_SD314_230904	✓	✓
EP2312228-021	04-Sep-2023 00:00	0089_SD409_230904	✓	✓
EP2312228-022	04-Sep-2023 00:00	0089_QC108_230904	✓	✓
EP2312228-024	04-Sep-2023 00:00	0089_SD415_230904	✓	✓
EP2312228-026	04-Sep-2023 00:00	0089_SD413_230904	✓	✓
EP2312228-029	04-Sep-2023 00:00	0089_SD411_230904	✓	✓
EP2312228-030	04-Sep-2023 00:00	0089_QC111_230904	✓	✓
EP2312228-031	04-Sep-2023 00:00	0089_SD308_230904	✓	✓
EP2312228-032	04-Sep-2023 00:00	0089_SD316_230904	✓	✓
EP2312228-033	04-Sep-2023 00:00	0089_SD307_230904	✓	✓
EP2312228-034	04-Sep-2023 00:00	0089_SD315_230904	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2312228-001	04-Sep-2023 00:00	0089_MW215_230904	✓	✓
EP2312228-002	04-Sep-2023 00:00	0089_PW308_230904	✓	✓
EP2312228-003	04-Sep-2023 00:00	0089_PW316_230904	✓	✓
EP2312228-004	04-Sep-2023 00:00	0089_PW307_230904	✓	✓
EP2312228-005	04-Sep-2023 00:00	0089_PW315_230904	✓	✓
EP2312228-006	04-Sep-2023 00:00	0089_SW317_230904	✓	✓
EP2312228-007	04-Sep-2023 00:00	0089_QC101_230904	✓	

			WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2312228-012	04-Sep-2023 00:00	0089_SW318_230904	✓	✓
EP2312228-013	04-Sep-2023 00:00	0089_SW319_230904	✓	✓
EP2312228-014	04-Sep-2023 00:00	0089_SW309_230904	✓	✓
EP2312228-015	04-Sep-2023 00:00	0089_SW310_230904	✓	✓
EP2312228-016	04-Sep-2023 00:00	0089_SW311_230904	✓	✓
EP2312228-019	04-Sep-2023 00:00	0089_SW410_230904	✓	✓
EP2312228-020	04-Sep-2023 00:00	0089_QC107_230904	✓	
EP2312228-023	04-Sep-2023 00:00	0089_SW416_230904	✓	✓
EP2312228-025	04-Sep-2023 00:00	0089_SW414_230904	✓	✓
EP2312228-027	04-Sep-2023 00:00	0089_SW412_230904	✓	✓
EP2312228-028	04-Sep-2023 00:00	0089_QC109_230904	✓	
EP2312228-035	04-Sep-2023 00:00	0089_QC301_230904	✓	
EP2312228-036	04-Sep-2023 00:00	0089_QC302_230904	✓	
EP2312228-037	04-Sep-2023 00:00	0089_QC401_230904	✓	
EP2312228-038	04-Sep-2023 00:00	0089_QC402_230904	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312228**	Page	: 1 of 25
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023 08:00
Order number	: ----	Date Analysis Commenced	: 06-Sep-2023
C-O-C number	: ----	Issue Date	: 14-Sep-2023 17:34
Sampler	: ----		
Site	: ----		
Quote number	: SY/139/19 B		
No. of samples received	: 38		
No. of samples analysed	: 38		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Lab Technichian	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- ED037-P (Alkalinity): LCS recovery falls outside ALS Dynamic Control Limit. However, it is within the acceptance criteria based on ALS DQO. No further action is required.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW215_230904	0089_PW308_230904	0089_PW316_230904	0089_PW307_230904	0089_PW315_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-001	EP2312228-002	EP2312228-003	EP2312228-004	EP2312228-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		256	130	128	125	126
Total Alkalinity as CaCO3	----	1	mg/L		256	130	128	125	126
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		59	2800	2610	2640	2600
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		220	18800	19100	18600	18200
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		98	453	450	450	443
Magnesium	7439-95-4	1	mg/L		22	1480	1470	1480	1440
Sodium	7440-23-5	1	mg/L		101	11600	11400	11600	11300
Potassium	7440-09-7	1	mg/L		5	563	559	566	555
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		12.5	591	596	582	570
ø Total Cations	----	0.01	meq/L		11.2	663	654	663	646
ø Ionic Balance	----	0.01	%		5.58	5.75	4.64	6.52	6.27
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.05	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.49	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		0.06	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW215_230904	0089_PW308_230904	0089_PW316_230904	0089_PW307_230904	0089_PW315_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-001	EP2312228-002	EP2312228-003	EP2312228-004	EP2312228-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW215_230904	0089_PW308_230904	0089_PW316_230904	0089_PW307_230904	0089_PW315_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-001	EP2312228-002	EP2312228-003	EP2312228-004	EP2312228-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.62**	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.49**	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.57**	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**87.9**	**98.9**	**90.6**	**94.1**	**95.1**
13C8-PFOA	----	0.02	%		**93.3**	**95.2**	**91.3**	**90.9**	**93.1**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD378_230904	0089_QC103_230904	0089_SD374_230904	0089_SD375_230904	0089_SD306_230904
			Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EP2312228-008	EP2312228-009	EP2312228-010	EP2312228-011	EP2312228-017
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**17.2**	**14.5**	**13.4**	**10.0**	**13.2**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD378_230904	0089_QC103_230904	0089_SD374_230904	0089_SD375_230904	0089_SD306_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-008	EP2312228-009	EP2312228-010	EP2312228-011	EP2312228-017
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**100**	**116**	**115**	**102**	**106**
13C8-PFOA	----	0.0002	%		**98.5**	**98.5**	**97.0**	**92.5**	**98.5**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD314_230904	0089_SD409_230904	0089_QC108_230904	0089_SD415_230904	0089_SD413_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-018	EP2312228-021	EP2312228-022	EP2312228-024	EP2312228-026
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**9.8**	**30.3**	**30.7**	**12.6**	**15.0**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD314_230904	0089_SD409_230904	0089_QC108_230904	0089_SD415_230904	0089_SD413_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-018	EP2312228-021	EP2312228-022	EP2312228-024	EP2312228-026
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**106**	**118**	**114**	**115**	**112**
13C8-PFOA	----	0.0002	%		**99.0**	**98.0**	**91.5**	**95.0**	**99.0**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD411_230904	0089_QC111_230904	0089_SD308_230904	0089_SD316_230904	0089_SD307_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-029	EP2312228-030	EP2312228-031	EP2312228-032	EP2312228-033
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**13.9**	**14.7**	**7.9**	**11.0**	**14.3**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD411_230904	0089_QC111_230904	0089_SD308_230904	0089_SD316_230904	0089_SD307_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-029	EP2312228-030	EP2312228-031	EP2312228-032	EP2312228-033
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**104**	**105**	**112**	**105**	**116**
13C8-PFOA	----	0.0002	%		**97.0**	**95.5**	**96.0**	**95.5**	**100**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD315_230904	----	----	----	----
				Sampling date / time	04-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312228-034	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**10.9**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD315_230904	----	----	----	----
				Sampling date / time	04-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312228-034	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**114**	----	----	----	----
13C8-PFOA	----	0.0002	%		**101**	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW317_230904	0089_QC101_230904	0089_SW318_230904	0089_SW319_230904	0089_SW309_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-006	EP2312228-007	EP2312228-012	EP2312228-013	EP2312228-014
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**131**	----	**130**	**131**	**126**
Total Alkalinity as CaCO3	----	1	mg/L		**131**	----	**130**	**131**	**126**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2550**	----	**2520**	**2530**	**2790**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17900**	----	**18500**	**18300**	**18600**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**438**	----	**434**	**448**	**446**
Magnesium	7439-95-4	1	mg/L		**1420**	----	**1410**	**1460**	**1470**
Sodium	7440-23-5	1	mg/L		**11100**	----	**10900**	**11400**	**11500**
Potassium	7440-09-7	1	mg/L		**543**	----	**533**	**552**	**554**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**561**	----	**577**	**572**	**585**
ø Total Cations	----	0.01	meq/L		**635**	----	**625**	**652**	**658**
ø Ionic Balance	----	0.01	%		**6.25**	----	**4.04**	**6.62**	**5.82**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW317_230904	0089_QC101_230904	0089_SW318_230904	0089_SW319_230904	0089_SW309_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-006	EP2312228-007	EP2312228-012	EP2312228-013	EP2312228-014
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW317_230904	0089_QC101_230904	0089_SW318_230904	0089_SW319_230904	0089_SW309_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-006	EP2312228-007	EP2312228-012	EP2312228-013	EP2312228-014
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.7**	**98.1**	**93.8**	**90.8**	**100**
13C8-PFOA	----	0.02	%		**93.7**	**102**	**96.0**	**94.1**	**95.2**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW310_230904	0089_SW311_230904	0089_SW410_230904	0089_QC107_230904	0089_SW416_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-015	EP2312228-016	EP2312228-019	EP2312228-020	EP2312228-023
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**126**	**125**	**132**	----	**128**
Total Alkalinity as CaCO3	----	1	mg/L		**126**	**125**	**132**	----	**128**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2490**	**2450**	**2450**	----	**2450**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17700**	**17900**	**17700**	----	**17900**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**444**	**443**	**464**	----	**438**
Magnesium	7439-95-4	1	mg/L		**1430**	**1430**	**1490**	----	**1410**
Sodium	7440-23-5	1	mg/L		**10900**	**10900**	**11300**	----	**10700**
Potassium	7440-09-7	1	mg/L		**555**	**554**	**582**	----	**544**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**554**	**558**	**553**	----	**558**
ø Total Cations	----	0.01	meq/L		**628**	**628**	**652**	----	**617**
ø Ionic Balance	----	0.01	%		**6.30**	**5.87**	**8.24**	----	**5.00**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW310_230904	0089_SW311_230904	0089_SW410_230904	0089_QC107_230904	0089_SW416_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-015	EP2312228-016	EP2312228-019	EP2312228-020	EP2312228-023
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW310_230904	0089_SW311_230904	0089_SW410_230904	0089_QC107_230904	0089_SW416_230904
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EP2312228-015	EP2312228-016	EP2312228-019	EP2312228-020	EP2312228-023
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.6**	**100**	**97.9**	**99.4**	**94.1**
13C8-PFOA	----	0.02	%		**102**	**101**	**94.2**	**87.9**	**94.7**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW414_230904	0089_SW412_230904	0089_QC109_230904	----	----
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EP2312228-025	EP2312228-027	EP2312228-028	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**126**	**128**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**126**	**128**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2480**	**2480**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18400**	**18200**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**442**	**440**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1420**	**1420**	----	----	----
Sodium	7440-23-5	1	mg/L		**10800**	**10800**	----	----	----
Potassium	7440-09-7	1	mg/L		**551**	**554**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**573**	**568**	----	----	----
ø Total Cations	----	0.01	meq/L		**623**	**623**	----	----	----
ø Ionic Balance	----	0.01	%		**4.15**	**4.64**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW414_230904	0089_SW412_230904	0089_QC109_230904	----	----
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EP2312228-025	EP2312228-027	EP2312228-028	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW414_230904	0089_SW412_230904	0089_QC109_230904	----	----
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EP2312228-025	EP2312228-027	EP2312228-028	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	**----**	**----**
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	**----**	**----**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**----**	**----**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	**----**	**----**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.8**	**90.5**	**96.3**	**----**	**----**
13C8-PFOA	----	0.02	%		**96.6**	**94.4**	**96.5**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC301_230904	0089_QC302_230904	0089_QC401_230904	0089_QC402_230904	----
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit		EP2312228-035	EP2312228-036	EP2312228-037	EP2312228-038	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC301_230904	0089_QC302_230904	0089_QC401_230904	0089_QC402_230904	----
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit		EP2312228-035	EP2312228-036	EP2312228-037	EP2312228-038	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.9**	**95.3**	**95.2**	**98.5**	----
13C8-PFOA	----	0.02	%		**96.7**	**94.9**	**102**	**99.1**	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: SEDIMENT		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2312228**	Page	: 1 of 17
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Order number	: ----	Date Analysis Commenced	: 06-Sep-2023
C-O-C number	: ----	Issue Date	: 14-Sep-2023
Sampler	: ----		
Site	: ----		
Quote number	: SY/139/19 B		
No. of samples received	: 38		
No. of samples analysed	: 38		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Lab Technichian	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5291413)									
EP2312228-008	0089_SD378_230904	EA055: Moisture Content	----	0.1	%	17.2	15.7	9.4	0% - 20%
EP2312228-029	0089_SD411_230904	EA055: Moisture Content	----	0.1	%	13.9	13.5	2.8	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5281117)									
EP2312160-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0008	0.0010	20.4	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0037	0.0039	4.4	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2312228-021	0089_SD409_230904	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5281117)									
EP2312160-009	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0058	0.0064	8.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0035	0.0038	9.2	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0013	0.0013	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0009	0.0009	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5281117) - continued									
EP2312160-009	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	0.002	0.002	0.0	No Limit
EP2312228-021	0089_SD409_230904	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5281117)									
EP2312160-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312228-021	0089_SD409_230904	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5281117)									
EP2312160-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	0.0045	0.0050	10.4	0% - 50%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	0.0017	0.0018	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312228-021	0089_SD409_230904	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5281117)									
EP2312160-009	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0244	0.0264	7.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0045	0.0049	8.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0244	0.0264	7.9	0% - 20%
EP2312228-021	0089_SD409_230904	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5286332)									
EP2312228-002	0089_PW308_230904	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	130	128	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	130	128	1.0	0% - 20%
EP2312228-016	0089_SW311_230904	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	127	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	125	127	1.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5281174)									
EP2312225-022	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	246	252	2.4	0% - 20%
EP2312225-035	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	37	42	13.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5281197)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5281197) - continued									
EP2312170-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	17	18	0.0	0% - 50%
EP2312214-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	14	14	0.0	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 5281173)									
EP2312225-022	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	669	668	0.2	0% - 20%
EP2312225-035	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	607	670	9.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5281198)									
EP2312170-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	120	119	0.0	0% - 20%
EP2312214-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	436	437	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5283125)									
EP2312161-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EP2312184-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	469	460	1.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1520	1500	1.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	11700	1.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	577	565	2.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5283126)									
EP2312228-005	0089_PW315_230904	ED093F: Calcium	7440-70-2	1	mg/L	443	444	0.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1440	1460	1.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11300	11400	1.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	555	560	0.9	0% - 20%
EP2312228-027	0089_SW412_230904	ED093F: Calcium	7440-70-2	1	mg/L	440	437	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1420	1410	1.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10800	10700	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	554	547	1.2	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5280990)									
EP2312225-020	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.06	105	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5280992)									
EP2312228-014	0089_SW309_230904	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5280992) - continued									
EP2312228-014	0089_SW309_230904	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5280990)									
EP2312225-020	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5280992)									
EP2312228-014	0089_SW309_230904	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5280990)									
EP2312225-020	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5280992)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5280992) - continued									
EP2312228-014	0089_SW309_230904	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5280990)									
EP2312225-020	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5280992)									
EP2312228-014	0089_SW309_230904	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5280990)									
EP2312225-020	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	0.06	143	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	0.06	143	No Limit
EP231P: PFAS Sums (QC Lot: 5280992)									
EP2312228-014	0089_SW309_230904	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5280992) - continued									
EP2312228-014	0089_SW309_230904	EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5281117)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	102	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	86.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	95.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	91.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	96.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5281117)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.9	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	98.8	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5281117)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.9	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.3	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.8	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281117)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281117) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	90.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	97.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	103	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	89.6	54.8	124
EP231P: PFAS Sums (QCLot: 5281117)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED037P: Alkalinity by PC Titrator (QCLot: 5286332)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	# 112	91.2	110
				<1	200 mg/L	105	91.2	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281174)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.1	89.9	112
				<1	500 mg/L	96.9	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281197)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	93.8	89.9	112
				<1	500 mg/L	99.8	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5281173)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	107	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 5281198)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	88.6	113
				<1	1000 mg/L	92.3	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5283125)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.4	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	94.6	91.4	113

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 5283125) - continued								
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.8	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5283126)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	107	88.4	110
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5280990)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	109	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	98.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	84.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	93.9	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	87.5	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	96.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5280992)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	90.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	91.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	103	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	90.7	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5280995)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	95.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	112	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	98.5	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	87.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5280990)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	93.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	97.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.6	71.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5280990) - continued								
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5280992)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	99.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	91.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	91.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	83.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	95.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5280995)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	97.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	97.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	95.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	100	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	103	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	96.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	94.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5280990)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	101	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	85.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.1	68.3	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5280990) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	105	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	95.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	94.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5280992)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	91.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	85.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	97.5	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	94.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	93.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	79.0	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5280995)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	106	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	98.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	96.6	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	101	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	103	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	98.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5280990)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	103	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	107	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	85.7	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5280992)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	98.6	63.0	143

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5280992) - continued								
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	97.7	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	90.0	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5280995)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	104	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	120	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	108	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	98.3	64.2	133
EP231P: PFAS Sums (QCLot: 5280990)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5280992)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5280995)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5281117)							
EP2312160-010	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	113	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	119	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	95.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	102	70.0	132

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Acceptable Limits (%) Low	Acceptable Limits (%) High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5281117) - continued							
EP2312160-010	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	134	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	80.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5281117)							
EP2312160-010	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	107	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	120	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	122	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	116	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	110	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	108	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	103	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	100	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	103	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	90.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	111	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5281117)							
EP2312160-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	94.8	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	118	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	94.9	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	110	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	101	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	104	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	86.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5281117)							
EP2312160-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	105	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	97.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	101	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	80.4	60.0	130

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Acceptable Limits (%) Low	Acceptable Limits (%) High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281174)							
EP2312225-022	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	122	70.4	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5281197)							
EP2312170-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	108	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5281173)							
EP2312225-022	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	108	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5281198)							
EP2312170-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	112	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5280992)							
EP2312225-027	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.6	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	86.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	94.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	97.5	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5280992)							
EP2312225-027	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	88.6	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	76.9	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	90.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	88.6	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	89.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	96.4	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	93.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	87.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	104	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	101	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5280992)							
EP2312225-027	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	98.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	88.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	87.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	95.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	100	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	109	65.0	136

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5280992) - continued							
EP2312225-027	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	88.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5280992)							
EP2312225-027	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	96.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	95.9	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	93.1	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.5	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312228**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 06-Sep-2023
Site	: ----	Issue Date	: 14-Sep-2023
Sampler	: ----	No. of samples received	: 38
Order number	: ----	No. of samples analysed	: 38

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
ED037P: Alkalinity by PC Titrator	QC-5286332-002	----	**Total Alkalinity as CaCO3**	----	112 %	91.2-110%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2312225--027	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2312225--027	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
0089_MW215_230904, 0089_PW308_230904, 0089_PW316_230904, 0089_PW307_230904, 0089_PW315_230904, 0089_SW317_230904, 0089_SW318_230904, 0089_SW319_230904, 0089_SW309_230904, 0089_SW310_230904, 0089_SW311_230904, 0089_SW410_230904, 0089_SW416_230904, 0089_SW414_230904, 0089_SW412_230904	----	----	----	13-Sep-2023	11-Sep-2023	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
	2				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	41	4.88	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	41	2.44	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD378_230904,	0089_QC103_230904,	**04-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	18-Sep-2023	✓
0089_SD374_230904,	0089_SD375_230904,							
0089_SD306_230904,	0089_SD314_230904,							
0089_SD409_230904,	0089_QC108_230904,							
0089_SD415_230904,	0089_SD413_230904,							
0089_SD411_230904,	0089_QC111_230904,							
0089_SD308_230904,	0089_SD316_230904,							
0089_SD307_230904,	0089_SD315_230904							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD378_230904,	0089_QC103_230904,	**04-Sep-2023**	**08-Sep-2023**	02-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
0089_SD374_230904,	0089_SD375_230904,							
0089_SD306_230904,	0089_SD314_230904,							
0089_SD409_230904,	0089_QC108_230904,							
0089_SD415_230904,	0089_SD413_230904,							
0089_SD411_230904,	0089_QC111_230904,							
0089_SD308_230904,	0089_SD316_230904,							
0089_SD307_230904,	0089_SD315_230904							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD378_230904,	0089_QC103_230904,	**04-Sep-2023**	**08-Sep-2023**	02-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
0089_SD374_230904,	0089_SD375_230904,							
0089_SD306_230904,	0089_SD314_230904,							
0089_SD409_230904,	0089_QC108_230904,							
0089_SD415_230904,	0089_SD413_230904,							
0089_SD411_230904,	0089_QC111_230904,							
0089_SD308_230904,	0089_SD316_230904,							
0089_SD307_230904,	0089_SD315_230904							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD378_230904, 0089_QC103_230904, 0089_SD374_230904, 0089_SD375_230904, 0089_SD306_230904, 0089_SD314_230904, 0089_SD409_230904, 0089_QC108_230904, 0089_SD415_230904, 0089_SD413_230904, 0089_SD411_230904, 0089_QC111_230904, 0089_SD308_230904, 0089_SD316_230904, 0089_SD307_230904, 0089_SD315_230904	**04-Sep-2023**	**08-Sep-2023**	02-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD378_230904, 0089_QC103_230904, 0089_SD374_230904, 0089_SD375_230904, 0089_SD306_230904, 0089_SD314_230904, 0089_SD409_230904, 0089_QC108_230904, 0089_SD415_230904, 0089_SD413_230904, 0089_SD411_230904, 0089_QC111_230904, 0089_SD308_230904, 0089_SD316_230904, 0089_SD307_230904, 0089_SD315_230904	**04-Sep-2023**	**08-Sep-2023**	02-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD378_230904, 0089_QC103_230904, 0089_SD374_230904, 0089_SD375_230904, 0089_SD306_230904, 0089_SD314_230904, 0089_SD409_230904, 0089_QC108_230904, 0089_SD415_230904, 0089_SD413_230904, 0089_SD411_230904, 0089_QC111_230904, 0089_SD308_230904, 0089_SD316_230904, 0089_SD307_230904, 0089_SD315_230904	**04-Sep-2023**	**08-Sep-2023**	02-Mar-2024	✓	**08-Sep-2023**	18-Oct-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW215_230904, 0089_PW308_230904, 0089_PW316_230904, 0089_PW307_230904, 0089_PW315_230904, 0089_SW317_230904, 0089_SW318_230904, 0089_SW319_230904, 0089_SW309_230904, 0089_SW310_230904, 0089_SW311_230904, 0089_SW410_230904, 0089_SW416_230904, 0089_SW414_230904, 0089_SW412_230904	**04-Sep-2023**	**----**	----	**----**	**09-Sep-2023**	18-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW310_230904, 0089_SW311_230904, 0089_SW410_230904, 0089_SW416_230904, 0089_SW414_230904, 0089_SW412_230904	**04-Sep-2023**	**----**	----	**----**	**13-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Natural (ED041G)							
0089_MW215_230904, 0089_PW308_230904, 0089_PW316_230904, 0089_PW307_230904, 0089_PW315_230904, 0089_SW317_230904, 0089_SW318_230904, 0089_SW319_230904, 0089_SW309_230904	**04-Sep-2023**	**----**	----	**----**	**14-Sep-2023**	02-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW310_230904, 0089_SW311_230904, 0089_SW410_230904, 0089_SW416_230904, 0089_SW414_230904, 0089_SW412_230904	**04-Sep-2023**	**----**	----	**----**	**13-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
0089_MW215_230904, 0089_PW308_230904, 0089_PW316_230904, 0089_PW307_230904, 0089_PW315_230904, 0089_SW317_230904, 0089_SW318_230904, 0089_SW319_230904, 0089_SW309_230904	**04-Sep-2023**	**----**	----	**----**	**14-Sep-2023**	02-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW215_230904, 0089_PW308_230904, 0089_PW316_230904, 0089_PW307_230904, 0089_PW315_230904, 0089_SW317_230904, 0089_SW318_230904, 0089_SW319_230904, 0089_SW309_230904, 0089_SW310_230904, 0089_SW311_230904, 0089_SW410_230904, 0089_SW416_230904, 0089_SW414_230904, 0089_SW412_230904	**04-Sep-2023**	**----**	----	**----**	**13-Sep-2023**	11-Sep-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW307_230904, 0089_PW315_230904, 0089_SW317_230904, 0089_QC101_230904, 0089_SW309_230904, 0089_SW310_230904, 0089_SW311_230904, 0089_SW410_230904, 0089_QC107_230904, 0089_SW412_230904, 0089_QC109_230904, 0089_QC301_230904, 0089_QC302_230904, 0089_QC401_230904, 0089_QC402_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**06-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW215_230904, 0089_PW308_230904, 0089_PW316_230904, 0089_SW318_230904, 0089_SW319_230904, 0089_SW416_230904, 0089_SW414_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**07-Sep-2023**	02-Mar-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW307_230904, 0089_PW315_230904, 0089_SW317_230904, 0089_QC101_230904, 0089_SW309_230904, 0089_SW310_230904, 0089_SW311_230904, 0089_SW410_230904, 0089_QC107_230904, 0089_SW412_230904, 0089_QC109_230904, 0089_QC301_230904, 0089_QC302_230904, 0089_QC401_230904, 0089_QC402_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**06-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW215_230904, 0089_PW308_230904, 0089_PW316_230904, 0089_SW318_230904, 0089_SW319_230904, 0089_SW416_230904, 0089_SW414_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**07-Sep-2023**	02-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0089_PW307_230904, 0089_PW315_230904, 0089_SW317_230904, 0089_QC101_230904, 0089_SW309_230904, 0089_SW310_230904, 0089_SW311_230904, 0089_SW410_230904, 0089_QC107_230904, 0089_SW412_230904, 0089_QC109_230904, 0089_QC301_230904, 0089_QC302_230904, 0089_QC401_230904, 0089_QC402_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**06-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW215_230904, 0089_PW308_230904, 0089_PW316_230904, 0089_SW318_230904, 0089_SW319_230904, 0089_SW416_230904, 0089_SW414_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**07-Sep-2023**	02-Mar-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_PW307_230904, 0089_PW315_230904, 0089_SW317_230904, 0089_QC101_230904, 0089_SW309_230904, 0089_SW310_230904, 0089_SW311_230904, 0089_SW410_230904, 0089_QC107_230904, 0089_SW412_230904, 0089_QC109_230904, 0089_QC301_230904, 0089_QC302_230904, 0089_QC401_230904, 0089_QC402_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**06-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW215_230904, 0089_PW308_230904, 0089_PW316_230904, 0089_SW318_230904, 0089_SW319_230904, 0089_SW416_230904, 0089_SW414_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**07-Sep-2023**	02-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW307_230904, 0089_PW315_230904, 0089_QC101_230904, 0089_SW309_230904, 0089_SW310_230904, 0089_SW311_230904, 0089_SW410_230904, 0089_QC107_230904, 0089_SW412_230904, 0089_QC109_230904, 0089_QC301_230904, 0089_QC302_230904, 0089_QC401_230904, 0089_QC402_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**06-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW215_230904, 0089_PW308_230904, 0089_PW316_230904, 0089_SW318_230904, 0089_SW319_230904, 0089_SW416_230904, 0089_SW414_230904	**04-Sep-2023**	**06-Sep-2023**	02-Mar-2024	✓	**07-Sep-2023**	02-Mar-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	30	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	41	**4.88**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	41	**7.32**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	41	**7.32**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	41	**2.44**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING Intelligence

ALS

Environmental Division
Perth
Work Order Reference
EP2312525

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: Garden Island **Client:** Stantec **Project Manager:** [redacted]
Phone: [redacted]

ALS Compass COC Reference: [redacted] **# Samples:** ST66, ST70, ST71 **Sampler:** [redacted]
Phone: [redacted]

Turnaround Requirements: Standard _____ Urgent _____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/4/23	Date / Time: 12/9 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 57170 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW356		11/09/2023 11:26 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_PW337		11/09/2023 11:31 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_SW150		11/09/2023 11:35 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW357		11/09/2023 11:51 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW330		11/09/2023 11:55 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_SW152		11/09/2023 12:02 PM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_SW156		11/09/2023 12:04 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 57170 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_SW154		11/09/2023 12:05 PM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_PW329		11/09/2023 12:26 PM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_PW358		11/09/2023 12:27 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 57170 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW356	HDPE (no PTFE)	20 mL	00350822062421	Grey	No	
001	0089_PW356	HDPE (no PTFE)	20 mL	00350822062528	Grey	No	
001	0089_PW356	Clear Plastic Bottle - Natural	125 mL	00070522067090	Green	No	
002	0089_PW337	HDPE (no PTFE)	20 mL	00350822057932	Grey	No	
002	0089_PW337	HDPE (no PTFE)	20 mL	00350822057719	Grey	No	
002	0089_PW337	Clear Plastic Bottle - Natural	125 mL	00070522045964	Green	No	
003	0089_SW150	HDPE (no PTFE)	20 mL	00350522039248	Grey	No	
003	0089_SW150	HDPE (no PTFE)	20 mL	00350522039147	Grey	No	
003	0089_SW150	Clear Plastic Bottle - Natural	125 mL	00070522067110	Green	No	
004	0089_PW357	HDPE (no PTFE)	20 mL	00350822007909	Grey	No	
004	0089_PW357	HDPE (no PTFE)	20 mL	00350822007801	Grey	No	
004	0089_PW357	Clear Plastic Bottle - Natural	125 mL	00070522068938	Green	No	
005	0089_PW330	HDPE (no PTFE)	20 mL	00350822082816	Grey	No	
005	0089_PW330	HDPE (no PTFE)	20 mL	00350822082701	Grey	No	
005	0089_PW330	Clear Plastic Bottle - Natural	125 mL	00070522068294	Green	No	
006	0089_SW152	HDPE (no PTFE)	20 mL	00350822075163	Grey	No	
006	0089_SW152	HDPE (no PTFE)	20 mL	00350822075182	Grey	No	
006	0089_SW152	Clear Plastic Bottle - Natural	125 mL	00070522045936	Green	No	
007	0089_SW156	Clear Plastic Bottle - Natural	125 mL	00070522045578	Green	No	
007	0089_SW156	HDPE (no PTFE)	20 mL	00350822062439	Grey	No	
007	0089_SW156	HDPE (no PTFE)	20 mL	00350822062521	Grey	No	
008	0089_SW154	Clear Plastic Bottle - Natural	125 mL	00070522068210	Green	No	
008	0089_SW154	HDPE (no PTFE)	20 mL	00350822086399	Grey	No	
008	0089_SW154	HDPE (no PTFE)	20 mL	00350822062529	Grey	No	
009	0089_PW329	Clear Plastic Bottle - Natural	125 mL	00070522068988	Green	No	
009	0089_PW329	HDPE (no PTFE)	20 mL	00350822007994	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 57170 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

009	0089_PW329	HDPE (no PTFE)	20 mL	00350822007947	Grey	No	
010	0089_PW358	Clear Plastic Bottle - Natural	125 mL	00070522068950	Green	No	
010	0089_PW358	HDPE (no PTFE)	20 mL	00350822007942	Grey	No	
010	0089_PW358	HDPE (no PTFE)	20 mL	00350822007859	Grey	No	

Total Bottle Count: ALS: 30, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312525**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 57170	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - ah		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 12-Sep-2023 12:15	Issue Date	: 13-Sep-2023
Client Requested Due Date	: 21-Sep-2023	Scheduled Reporting Date	: **21-Sep-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 17.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2312525-001	11-Sep-2023 11:26	0089_PW356_230911	✓	✓
EP2312525-002	11-Sep-2023 11:31	0089_PW337_230911	✓	✓
EP2312525-003	11-Sep-2023 11:35	0089_SW150_230911	✓	✓
EP2312525-004	11-Sep-2023 11:51	0089_PW357_230911	✓	✓
EP2312525-005	11-Sep-2023 11:55	0089_PW330_230911	✓	✓
EP2312525-006	11-Sep-2023 12:02	0089_SW152_230911	✓	✓
EP2312525-007	11-Sep-2023 12:04	0089_SW156_230911	✓	✓
EP2312525-008	11-Sep-2023 12:05	0089_SW154_230911	✓	✓
EP2312525-009	11-Sep-2023 12:26	0089_PW329_230911	✓	✓
EP2312525-010	11-Sep-2023 12:27	0089_PW358_230911	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312525**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Sep-2023 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2023
C-O-C number	: 57170	Issue Date	: 21-Sep-2023 17:06
Sampler	: [redacted]		
Site	: Stirling SW/PW - ah		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_230911	0089_PW337_230911	0089_SW150_230911	0089_PW357_230911	0089_PW330_230911
				Sampling date / time	11-Sep-2023 11:26	11-Sep-2023 11:31	11-Sep-2023 11:35	11-Sep-2023 11:51	11-Sep-2023 11:55
Compound	CAS Number	LOR	Unit		EP2312525-001	EP2312525-002	EP2312525-003	EP2312525-004	EP2312525-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		146	148	162	144	146
Total Alkalinity as CaCO3	----	1	mg/L		146	148	162	144	146
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2540	2540	2530	2650	2560
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18300	18400	18000	18500	18600
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		455	455	449	456	452
Magnesium	7439-95-4	1	mg/L		1470	1480	1450	1480	1480
Sodium	7440-23-5	1	mg/L		11400	11400	11100	11400	11400
Potassium	7440-09-7	1	mg/L		534	539	532	540	539
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		572	575	564	580	581
ø Total Cations	----	0.01	meq/L		653	654	638	654	654
ø Ionic Balance	----	0.01	%		6.63	6.45	6.20	6.02	5.92
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.01	0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_230911	0089_PW337_230911	0089_SW150_230911	0089_PW357_230911	0089_PW330_230911
				Sampling date / time	11-Sep-2023 11:26	11-Sep-2023 11:31	11-Sep-2023 11:35	11-Sep-2023 11:51	11-Sep-2023 11:55
Compound	CAS Number	LOR	Unit		EP2312525-001	EP2312525-002	EP2312525-003	EP2312525-004	EP2312525-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_230911	0089_PW337_230911	0089_SW150_230911	0089_PW357_230911	0089_PW330_230911
				Sampling date / time	11-Sep-2023 11:26	11-Sep-2023 11:31	11-Sep-2023 11:35	11-Sep-2023 11:51	11-Sep-2023 11:55
Compound	CAS Number	LOR	Unit		EP2312525-001	EP2312525-002	EP2312525-003	EP2312525-004	EP2312525-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.01**	**0.01**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.01**	**0.01**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.01**	**0.01**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.7**	**89.8**	**95.4**	**95.4**	**96.0**
13C8-PFOA	----	0.02	%		**94.7**	**89.1**	**100**	**91.4**	**90.9**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW152_230911	0089_SW156_230911	0089_SW154_230911	0089_PW329_230911	0089_PW358_230911
				Sampling date / time	11-Sep-2023 12:02	11-Sep-2023 12:04	11-Sep-2023 12:05	11-Sep-2023 12:26	11-Sep-2023 12:27
Compound	CAS Number	LOR	Unit		EP2312525-006	EP2312525-007	EP2312525-008	EP2312525-009	EP2312525-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**148**	**125**	**137**	**135**	**132**
Total Alkalinity as CaCO3	----	1	mg/L		**148**	**125**	**137**	**135**	**132**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2510**	**2500**	**2560**	**2530**	**2610**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18300**	**18500**	**19200**	**18500**	**17800**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**452**	**451**	**454**	**454**	**450**
Magnesium	7439-95-4	1	mg/L		**1460**	**1480**	**1480**	**1460**	**1460**
Sodium	7440-23-5	1	mg/L		**11200**	**11400**	**11400**	**11300**	**11300**
Potassium	7440-09-7	1	mg/L		**537**	**542**	**538**	**539**	**536**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**571**	**576**	**598**	**577**	**559**
ø Total Cations	----	0.01	meq/L		**644**	**654**	**654**	**648**	**648**
ø Ionic Balance	----	0.01	%		**5.94**	**6.31**	**4.51**	**5.78**	**7.35**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW152_230911	0089_SW156_230911	0089_SW154_230911	0089_PW329_230911	0089_PW358_230911
				Sampling date / time	11-Sep-2023 12:02	11-Sep-2023 12:04	11-Sep-2023 12:05	11-Sep-2023 12:26	11-Sep-2023 12:27
Compound	CAS Number	LOR	Unit		EP2312525-006	EP2312525-007	EP2312525-008	EP2312525-009	EP2312525-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW152_230911	0089_SW156_230911	0089_SW154_230911	0089_PW329_230911	0089_PW358_230911
				Sampling date / time	11-Sep-2023 12:02	11-Sep-2023 12:04	11-Sep-2023 12:05	11-Sep-2023 12:26	11-Sep-2023 12:27
Compound	CAS Number	LOR	Unit		EP2312525-006	EP2312525-007	EP2312525-008	EP2312525-009	EP2312525-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.3**	**99.5**	**101**	**95.3**	**97.3**
13C8-PFOA	----	0.02	%		**93.5**	**94.1**	**88.9**	**84.9**	**97.1**

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2312525**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2023
C-O-C number	: 57170	Issue Date	: 21-Sep-2023
Sampler	: [redacted]		
Site	: Stirling SW/PW - ah		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5307375)									
EP2312522-010	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	78	78	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	78	78	0.0	0% - 20%
EP2312525-010	0089_PW358_230911	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	132	134	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	132	134	1.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5295976)									
EP2312456-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<10	<10	0.0	No Limit
EP2312525-003	0089_SW150_230911	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2530	2520	0.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5295977)									
EP2312456-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	322	319	0.9	0% - 20%
EP2312525-003	0089_SW150_230911	ED045G: Chloride	16887-00-6	1	mg/L	18000	18100	0.7	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5295336)									
EP2312525-001	0089_PW356_230911	ED093F: Calcium	7440-70-2	1	mg/L	455	457	0.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1470	1480	0.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11400	11400	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	534	539	0.9	0% - 20%
EP2312528-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	112	112	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	104	104	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	668	671	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	32	32	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5296956)									
EP2312602-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5298430)									
EP2312615-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5296956)									
EP2312602-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5298430)									
EP2312615-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5296956)									
EP2312602-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5296956) - continued									
EP2312602-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.06	<0.06	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5298430)									
EP2312615-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5296956)									
EP2312602-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5298430)									
EP2312615-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5298430) - continued									
EP2312615-001	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5296956)									
EP2312602-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5298430)									
EP2312615-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5307375)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	114	85.1	126
				<1	200 mg/L	104	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5295976)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	92.6	89.9	112
				<1	500 mg/L	98.0	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5295977)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	107	88.6	113
				<1	1000 mg/L	99.7	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5295336)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	109	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.4	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5296956)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.9	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	91.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	78.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	83.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	87.3	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	78.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5298430)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	81.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	95.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	80.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	79.5	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	82.4	53.0	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5296956)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	84.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	80.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	89.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	86.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	88.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	86.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	86.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5298430)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	82.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	85.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	87.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	90.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	88.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	85.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5296956)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	87.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	88.5	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	77.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	82.3	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	90.1	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	84.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	112	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5298430)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	83.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.1	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	77.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	84.2	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	79.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	79.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5296956)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	88.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	96.3	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	85.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	87.8	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5298430)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	87.7	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	88.5	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	83.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	82.2	64.2	133
EP231P: PFAS Sums (QCLot: 5296956)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5298430)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5295976)							
EP2312456-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	126	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5295977)							
EP2312456-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	93.9	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5296956)							
EP2312602-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	86.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	82.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	78.4	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	92.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	83.0	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	73.8	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5298430)							
EP2312615-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	85.5	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	90.7	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	77.7	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	87.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	81.5	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	84.9	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5296956)							
EP2312602-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	84.6	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	87.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	90.8	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	83.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	81.4	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	81.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	84.9	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	81.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	88.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	78.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	89.8	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5298430)							
EP2312615-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	81.5	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	84.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	88.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.1	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	83.9	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	87.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	86.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	85.2	69.0	133

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5298430) - continued							
EP2312615-001	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	80.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	90.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	86.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5296956)							
EP2312602-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	70.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	79.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	78.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	78.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	84.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	93.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	83.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5298430)							
EP2312615-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	83.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	90.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	71.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	85.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	82.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	96.0	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	89.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5296956)							
EP2312602-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	96.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	89.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	79.2	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	123	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5298430)							
EP2312615-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	87.8	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	87.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	86.2	67.0	138

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5298430) - continued							
EP2312615-001	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	88.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312525**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Sep-2023
Site	: Stirling SW/PW - ah	Issue Date	: 21-Sep-2023
Sampler	: [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
0089_PW356_230911, 0089_PW337_230911, 0089_SW150_230911, 0089_PW357_230911, 0089_PW330_230911, 0089_SW152_230911, 0089_SW156_230911, 0089_SW154_230911, 0089_PW329_230911, 0089_PW358_230911	----	----	----	19-Sep-2023	18-Sep-2023	**1**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
	2				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	22	9.09	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW156_230911	**11-Sep-2023**	**----**	----	----	**19-Sep-2023**	25-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW356_230911, 0089_PW337_230911, 0089_SW150_230911, 0089_PW357_230911, 0089_PW330_230911, 0089_SW152_230911, 0089_SW154_230911, 0089_PW329_230911, 0089_PW358_230911	**11-Sep-2023**	**----**	----	----	**20-Sep-2023**	25-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW356_230911, 0089_PW337_230911, 0089_SW150_230911, 0089_PW357_230911, 0089_PW330_230911, 0089_SW152_230911, 0089_SW156_230911, 0089_SW154_230911, 0089_PW329_230911, 0089_PW358_230911	**11-Sep-2023**	**----**	----	----	**20-Sep-2023**	09-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW356_230911, 0089_PW337_230911, 0089_SW150_230911, 0089_PW357_230911, 0089_PW330_230911, 0089_SW152_230911, 0089_SW156_230911, 0089_SW154_230911, 0089_PW329_230911, 0089_PW358_230911	**11-Sep-2023**	**----**	----	----	**20-Sep-2023**	09-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW356_230911, 0089_PW337_230911, 0089_SW150_230911, 0089_PW357_230911, 0089_PW330_230911, 0089_SW152_230911, 0089_SW156_230911, 0089_SW154_230911, 0089_PW329_230911, 0089_PW358_230911	**11-Sep-2023**	**----**	----	----	**19-Sep-2023**	18-Sep-2023	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW356_230911, 0089_PW337_230911, 0089_SW150_230911, 0089_PW357_230911, 0089_PW330_230911, 0089_SW152_230911, 0089_SW156_230911, 0089_SW154_230911, 0089_PW329_230911, 0089_PW358_230911	**11-Sep-2023**	**14-Sep-2023**	09-Mar-2024	✓	**15-Sep-2023**	09-Mar-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW356_230911, 0089_PW337_230911, 0089_SW150_230911, 0089_PW357_230911, 0089_PW330_230911, 0089_SW152_230911, 0089_SW156_230911, 0089_SW154_230911, 0089_PW329_230911, 0089_PW358_230911	**11-Sep-2023**	**14-Sep-2023**	09-Mar-2024	✓	**15-Sep-2023**	09-Mar-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW356_230911, 0089_PW337_230911, 0089_SW150_230911, 0089_PW357_230911, 0089_PW330_230911, 0089_SW152_230911, 0089_SW156_230911, 0089_SW154_230911, 0089_PW329_230911, 0089_PW358_230911	**11-Sep-2023**	**14-Sep-2023**	09-Mar-2024	✓	**15-Sep-2023**	09-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW356_230911, 0089_PW337_230911, 0089_SW150_230911, 0089_PW357_230911, 0089_PW330_230911, 0089_SW152_230911, 0089_SW156_230911, 0089_SW154_230911, 0089_PW329_230911, 0089_PW358_230911	**11-Sep-2023**	**14-Sep-2023**	09-Mar-2024	✓	**15-Sep-2023**	09-Mar-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW356_230911, 0089_PW337_230911, 0089_SW150_230911, 0089_PW357_230911, 0089_PW330_230911, 0089_SW152_230911, 0089_SW156_230911, 0089_SW154_230911, 0089_PW329_230911, 0089_PW358_230911	**11-Sep-2023**	**14-Sep-2023**	09-Mar-2024	✓	**15-Sep-2023**	09-Mar-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	22	**9.09**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

Perth
Work Order Reference
EP2312526

Telephone : -- 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: Garden Island Client: Stantec

Project Manager: [redacted]
Phone: (

ALS Compass COC Reference: [redacted] # Samples: STGG, 57170, 57171

Sampler: [redacted]
Phone: (

Turnaround Requirements: Standard _____ Urgent _____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/9 12 3	Date / Time: 12/9 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 57171 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD356		11/09/2023 11:30 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD331		11/09/2023 11:31 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD357		11/09/2023 11:53 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD330		11/09/2023 11:58 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD358		11/09/2023 12:06 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD329		11/09/2023 12:07 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 57171 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD356	HDPE Soil Jar	200 mL	00621122090630	Grey	No	
002	0089_SD331	HDPE Soil Jar	200 mL	00621222077146	Grey	No	
003	0089_SD357	HDPE Soil Jar	200 mL	00621122090646	Grey	No	
004	0089_SD330	HDPE Soil Jar	200 mL	00621122090589	Grey	No	
005	0089_SD358	HDPE Soil Jar	200 mL	00621122090591	Grey	No	
006	0089_SD329	HDPE Soil Jar	200 mL	00621122090726	Grey	No	

Total Bottle Count: ALS: 6, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312526**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 57171	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - ah		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 12-Sep-2023 12:15	Issue Date	: 13-Sep-2023
Client Requested Due Date	: 21-Sep-2023	Scheduled Reporting Date	: **21-Sep-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 17.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2312526-001	11-Sep-2023 11:30	0089_SD356_230911	✓	✓
EP2312526-002	11-Sep-2023 11:31	0089_SD331_230911	✓	✓
EP2312526-003	11-Sep-2023 11:53	0089_SD357_230911	✓	✓
EP2312526-004	11-Sep-2023 11:58	0089_SD330_230911	✓	✓
EP2312526-005	11-Sep-2023 12:06	0089_SD358_230911	✓	✓
EP2312526-006	11-Sep-2023 12:07	0089_SD329_230911	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312526**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Sep-2023 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Sep-2023
C-O-C number	: 57171	Issue Date	: 20-Sep-2023 13:18
Sampler	: [redacted]		
Site	: Stirling SD - ah		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD356_230911	0089_SD331_230911	0089_SD357_230911	0089_SD330_230911	0089_SD358_230911
				Sampling date / time	11-Sep-2023 11:30	11-Sep-2023 11:31	11-Sep-2023 11:53	11-Sep-2023 11:58	11-Sep-2023 12:06
Compound	CAS Number	LOR	Unit		EP2312526-001	EP2312526-002	EP2312526-003	EP2312526-004	EP2312526-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**35.1**	**26.7**	**26.0**	**28.0**	**26.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD356_230911	0089_SD331_230911	0089_SD357_230911	0089_SD330_230911	0089_SD358_230911
				Sampling date / time	11-Sep-2023 11:30	11-Sep-2023 11:31	11-Sep-2023 11:53	11-Sep-2023 11:58	11-Sep-2023 12:06
Compound	CAS Number	LOR	Unit		EP2312526-001	EP2312526-002	EP2312526-003	EP2312526-004	EP2312526-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**90.5**	**96.0**	**98.0**	**94.0**	**92.0**
13C8-PFOA	----	0.0002	%		**88.0**	**102**	**98.0**	**98.5**	**94.0**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD329_230911	----	----	----	----
				Sampling date / time	11-Sep-2023 12:07	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312526-006	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**28.2**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD329_230911	----	----	----	----
				Sampling date / time	11-Sep-2023 12:07	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2312526-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**86.5**	----	----	----	----
13C8-PFOA	----	0.0002	%		**98.0**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2312526**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Sep-2023
C-O-C number	: 57171	Issue Date	: 20-Sep-2023
Sampler	: [redacted]		
Site	: Stirling SD - ah		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5303597)									
EP2312253-102	Anonymous	EA055: Moisture Content	----	0.1	%	17.7	16.3	8.3	0% - 20%
EP2312526-006	0089_SD329_230911	EA055: Moisture Content	----	0.1	%	28.2	28.3	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5298125)									
EP2312491-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2312526-005	0089_SD358_230911	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5298125)									
EP2312491-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5298125) - continued									
EP2312491-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2312526-005	0089_SD358_230911	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5298125)									
EP2312491-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312526-005	0089_SD358_230911	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5298125)									
EP2312491-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2312526-005	0089_SD358_230911	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5298125)									
EP2312491-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2312526-005	0089_SD358_230911	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5298125)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	98.6	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	81.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	92.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	88.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	77.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5298125)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.6	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	103	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5298125)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.6	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.7	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.8	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.6	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5298125)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5298125) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	91.0	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	101	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	112	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	97.5	54.8	124
EP231P: PFAS Sums (QCLot: 5298125)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5298125)							
EP2312523-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	91.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	104	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	83.7	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	83.2	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	119	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5298125)							
EP2312523-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	88.4	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	98.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	90.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	98.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	98.1	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	102	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	102	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	108	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	106	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	102	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	100	69.0	133

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5298125)							
EP2312523-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	100	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	98.5	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	101	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	122	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	100	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	104	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	98.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5298125)							
EP2312523-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	96.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	112	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	93.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	104	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312526**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Sep-2023
Site	: Stirling SD - ah	Issue Date	: 20-Sep-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2312523--001	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD356_230911, 0089_SD331_230911, 0089_SD357_230911, 0089_SD330_230911, 0089_SD358_230911, 0089_SD329_230911	**11-Sep-2023**	**----**	----	----	**18-Sep-2023**	25-Sep-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_230911, 0089_SD331_230911, 0089_SD357_230911, 0089_SD330_230911, 0089_SD358_230911, 0089_SD329_230911	**11-Sep-2023**	**18-Sep-2023**	09-Mar-2024	✓	**18-Sep-2023**	28-Oct-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_230911, 0089_SD331_230911, 0089_SD357_230911, 0089_SD330_230911, 0089_SD358_230911, 0089_SD329_230911	**11-Sep-2023**	**18-Sep-2023**	09-Mar-2024	✓	**18-Sep-2023**	28-Oct-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD356_230911, 0089_SD331_230911, 0089_SD357_230911, 0089_SD330_230911, 0089_SD358_230911, 0089_SD329_230911	**11-Sep-2023**	**18-Sep-2023**	09-Mar-2024	✓	**18-Sep-2023**	28-Oct-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_230911, 0089_SD331_230911, 0089_SD357_230911, 0089_SD330_230911, 0089_SD358_230911, 0089_SD329_230911	**11-Sep-2023**	**18-Sep-2023**	09-Mar-2024	✓	**18-Sep-2023**	28-Oct-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD356_230911, 0089_SD331_230911, 0089_SD357_230911, 0089_SD330_230911, 0089_SD358_230911, 0089_SD329_230911	**11-Sep-2023**	**18-Sep-2023**	09-Mar-2024	✓	**18-Sep-2023**	28-Oct-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2312528

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: Barden Island **Client:** Stanfe

Project Manager: [redacted]
Phone: [redacted]

ALS Compass COC Reference: **# Samples:**

Sampler:
Phone:

ST166, ST170, ST171

Turnaround Requirements: Standard ____ Urgent ____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/9/23	Date / Time: 12/9 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) COC#: 57166 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW139		11/09/2023 10:26 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_MW141		11/09/2023 10:43 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_MW142		11/09/2023 11:03 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_MW149	Plus green bottle	11/09/2023 12:47 PM	WATER	ALS: 2 Non ALS: 0	No		X		
005	0089_MW147		11/09/2023 01:05 PM	WATER	ALS: 3 Non ALS: 0	No		X		
006	0089_QC307		11/09/2023 03:34 PM	WATER	ALS: 2 Non ALS: 0	No	X			
007	0089_QC407		11/09/2023 03:35 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

ALS COC#: 57166 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW ah

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW139	HDPE (no PTFE)	20 mL	00350822007872	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00350822007978	Grey	No	
001	0089_MW139	Clear Plastic Bottle - Natural	125 mL	00070522068974	Green	No	
002	0089_MW141	HDPE (no PTFE)	20 mL	00350822062667	Grey	No	
002	0089_MW141	HDPE (no PTFE)	20 mL	00350822062512	Grey	No	
002	0089_MW141	Clear Plastic Bottle - Natural	125 mL	00070522068183	Green	No	
003	0089_MW142	HDPE (no PTFE)	20 mL	00350822082867	Grey	No	
003	0089_MW142	HDPE (no PTFE)	20 mL	00350822082616	Grey	No	
003	0089_MW142	Clear Plastic Bottle - Natural	125 mL	00070522068406	Green	No	
004	0089_MW149	HDPE (no PTFE)	20 mL	00350822062586	Grey	No	
004	0089_MW149	HDPE (no PTFE)	20 mL	00350822062577	Grey	No	
005	0089_MW147	Clear Plastic Bottle - Natural	125 mL	00070522068947	Green	No	
005	0089_MW147	HDPE (no PTFE)	20 mL	00350822007911	Grey	No	
005	0089_MW147	HDPE (no PTFE)	20 mL	00350822007808	Grey	No	
006	0089_QC307	HDPE (no PTFE)	20 mL	00351221005753	Grey	No	
006	0089_QC307	HDPE (no PTFE)	20 mL	00351221005816	Grey	No	
007	0089_QC407	HDPE (no PTFE)	20 mL	00351221006088	Grey	No	
007	0089_QC407	HDPE (no PTFE)	20 mL	00351221006229	Grey	No	

Total Bottle Count: ALS: 18, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2312528**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 57166	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW ah		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 12-Sep-2023 12:15	Issue Date	: 13-Sep-2023
Client Requested Due Date	: 21-Sep-2023	Scheduled Reporting Date	: **21-Sep-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 17.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2312528-001	11-Sep-2023 10:26	0089_MW139_230911	✓	✓
EP2312528-002	11-Sep-2023 10:43	0089_MW141_230911	✓	✓
EP2312528-003	11-Sep-2023 11:03	0089_MW142_230911	✓	✓
EP2312528-004	11-Sep-2023 12:47	0089_MW149_230911	✓	✓
EP2312528-005	11-Sep-2023 13:05	0089_MW147_230911	✓	✓
EP2312528-006	11-Sep-2023 15:34	0089_QC307_230911	✓	
EP2312528-007	11-Sep-2023 15:35	0089_QC407_230911	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **EP2312528**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Sep-2023 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2023
C-O-C number	: 57166	Issue Date	: 21-Sep-2023 17:07
Sampler	: [redacted]		
Site	: Stirling GW ah		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_230911	0089_MW141_230911	0089_MW142_230911	0089_MW149_230911	0089_MW147_230911
				Sampling date / time	11-Sep-2023 10:26	11-Sep-2023 10:43	11-Sep-2023 11:03	11-Sep-2023 12:47	11-Sep-2023 13:05
Compound	CAS Number	LOR	Unit		EP2312528-001	EP2312528-002	EP2312528-003	EP2312528-004	EP2312528-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		219	448	385	220	463
Total Alkalinity as CaCO3	----	1	mg/L		219	448	385	220	463
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		198	1410	1490	2420	556
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1430	10500	11100	17300	4790
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		112	396	384	464	248
Magnesium	7439-95-4	1	mg/L		104	781	843	1390	357
Sodium	7440-23-5	1	mg/L		668	5780	6320	10700	2640
Potassium	7440-09-7	1	mg/L		32	301	340	514	121
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		48.8	334	352	543	156
ø Total Cations	----	0.01	meq/L		44.0	343	372	616	160
ø Ionic Balance	----	0.01	%		5.18	1.28	2.80	6.33	1.18
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.21	0.17	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.49	0.32	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	7.10	4.19	<0.01	0.04
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.89	0.14	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	33.2	3.27	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	0.28	0.28	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	3.05	3.07	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_230911	0089_MW141_230911	0089_MW142_230911	0089_MW149_230911	0089_MW147_230911
				Sampling date / time	11-Sep-2023 10:26	11-Sep-2023 10:43	11-Sep-2023 11:03	11-Sep-2023 12:47	11-Sep-2023 13:05
Compound	CAS Number	LOR	Unit		EP2312528-001	EP2312528-002	EP2312528-003	EP2312528-004	EP2312528-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.14**	**0.08**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.65**	**0.33**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_230911	0089_MW141_230911	0089_MW142_230911	0089_MW149_230911	0089_MW147_230911
				Sampling date / time	11-Sep-2023 10:26	11-Sep-2023 10:43	11-Sep-2023 11:03	11-Sep-2023 12:47	11-Sep-2023 13:05
Compound	CAS Number	LOR	Unit		EP2312528-001	EP2312528-002	EP2312528-003	EP2312528-004	EP2312528-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**46.1**	**11.8**	<0.01	**0.04**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**40.3**	**7.46**	<0.01	**0.04**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**44.7**	**11.4**	<0.01	**0.04**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.5**	**83.6**	**90.7**	**93.0**	**96.9**
13C8-PFOA	----	0.02	%		**91.5**	**90.8**	**93.6**	**90.2**	**95.3**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC307_230911	0089_QC407_230911	----	----	----
				Sampling date / time	11-Sep-2023 15:34	11-Sep-2023 15:35	----	----	----
Compound	CAS Number	LOR	Unit		EP2312528-006	EP2312528-007	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC307_230911	0089_QC407_230911	----	----	----
				Sampling date / time	11-Sep-2023 15:34	11-Sep-2023 15:35	----	----	----
Compound	CAS Number	LOR	Unit		EP2312528-006	EP2312528-007	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.3**	**94.7**	----	----	----
13C8-PFOA	----	0.02	%		**91.7**	**96.7**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2312528**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Sep-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2023
C-O-C number	: 57166	Issue Date	: 21-Sep-2023
Sampler	: [redacted]		
Site	: Stirling GW ah		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5307375)									
EP2312522-010	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	78	78	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	78	78	0.0	0% - 20%
EP2312525-010	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	132	134	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	132	134	1.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5295982)									
EP2312500-010	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	14	14	0.0	0% - 50%
EP2312640-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3	2	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5295983)									
EP2312500-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	331	332	0.4	0% - 20%
EP2312640-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	155	157	1.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5295336)									
EP2312525-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	455	457	0.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1470	1480	0.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11400	11400	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	534	539	0.9	0% - 20%
EP2312528-001	0089_MW139_230911	ED093F: Calcium	7440-70-2	1	mg/L	112	112	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	104	104	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	668	671	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	32	32	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5296956)									
EP2312602-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5298430)									
EP2312615-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5296956)									
EP2312602-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5298430)									
EP2312615-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5296956)									
EP2312602-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5296956) - continued									
EP2312602-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.06	<0.06	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5298430)									
EP2312615-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5296956)									
EP2312602-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5298430)									
EP2312615-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5298430) - continued									
EP2312615-001	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5296956)									
EP2312602-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5298430)									
EP2312615-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5307375)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	114	85.1	126
				<1	200 mg/L	104	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5295982)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.5	89.9	112
				<1	500 mg/L	98.1	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5295983)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	102	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5295336)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	109	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.4	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5296956)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.9	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	91.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	78.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	83.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	87.3	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	78.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5298430)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	81.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	95.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	80.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	79.5	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	82.4	53.0	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5296956)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	84.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	80.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	89.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	86.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	88.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	86.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	86.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5298430)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	82.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	85.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	87.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	90.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	88.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	85.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5296956)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	87.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	88.5	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	77.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	82.3	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	90.1	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	84.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	112	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5298430)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	83.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.1	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	77.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	84.2	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	79.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	79.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5296956)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	88.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	96.3	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	85.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	87.8	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5298430)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	87.7	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	88.5	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	83.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	82.2	64.2	133
EP231P: PFAS Sums (QCLot: 5296956)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5298430)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5295982)							
EP2312500-010	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	121	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5295983)							
EP2312500-010	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	93.1	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5296956)							
EP2312602-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	86.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	82.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	78.4	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	92.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	83.0	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	73.8	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5298430)							
EP2312615-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	85.5	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	90.7	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	77.7	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	87.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	81.5	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	84.9	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5296956)							
EP2312602-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	84.6	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	87.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	90.8	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	83.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	81.4	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	81.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	84.9	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	81.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	88.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	78.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	89.8	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5298430)							
EP2312615-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	81.5	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	84.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	88.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.1	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	83.9	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	87.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	86.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	85.2	69.0	133

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5298430) - continued							
EP2312615-001	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	80.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	90.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	86.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5296956)							
EP2312602-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	70.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	79.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	78.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	78.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	84.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	93.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	83.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5298430)							
EP2312615-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	83.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	90.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	71.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	85.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	82.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	96.0	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	89.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5296956)							
EP2312602-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	96.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	89.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	79.2	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	123	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5298430)							
EP2312615-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	87.8	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	87.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	86.2	67.0	138

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5298430) - continued							
EP2312615-001	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	88.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2312528**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Sep-2023
Site	: Stirling GW ah	Issue Date	: 21-Sep-2023
Sampler	: [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
0089_MW139_230911, 0089_MW141_230911, 0089_MW142_230911, 0089_MW149_230911, 0089_MW147_230911	----	----	----	19-Sep-2023	18-Sep-2023	**1**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
	2				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	22	9.09	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW139_230911, 0089_MW141_230911, 0089_MW142_230911, 0089_MW149_230911, 0089_MW147_230911	**11-Sep-2023**	**----**	----	----	**20-Sep-2023**	25-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW139_230911, 0089_MW141_230911, 0089_MW142_230911, 0089_MW149_230911, 0089_MW147_230911	**11-Sep-2023**	**----**	----	----	**21-Sep-2023**	09-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW139_230911, 0089_MW141_230911, 0089_MW142_230911, 0089_MW149_230911, 0089_MW147_230911	**11-Sep-2023**	**----**	----	----	**21-Sep-2023**	09-Oct-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW139_230911, 0089_MW141_230911, 0089_MW142_230911, 0089_MW149_230911, 0089_MW147_230911	**11-Sep-2023**	**----**	----	----	**19-Sep-2023**	18-Sep-2023	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_230911, 0089_MW141_230911, 0089_MW142_230911, 0089_MW149_230911, 0089_MW147_230911, 0089_QC307_230911, 0089_QC407_230911	**11-Sep-2023**	**14-Sep-2023**	09-Mar-2024	✓	**15-Sep-2023**	09-Mar-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_230911, 0089_MW141_230911, 0089_MW142_230911, 0089_MW149_230911, 0089_MW147_230911, 0089_QC307_230911, 0089_QC407_230911	**11-Sep-2023**	**14-Sep-2023**	09-Mar-2024	✓	**15-Sep-2023**	09-Mar-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW139_230911, 0089_MW141_230911, 0089_MW142_230911, 0089_MW149_230911, 0089_MW147_230911, 0089_QC307_230911, 0089_QC407_230911	**11-Sep-2023**	**14-Sep-2023**	09-Mar-2024	✓	**15-Sep-2023**	09-Mar-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_230911, 0089_MW141_230911, 0089_MW142_230911, 0089_MW149_230911, 0089_MW147_230911, 0089_QC307_230911, 0089_QC407_230911	**11-Sep-2023**	**14-Sep-2023**	09-Mar-2024	✓	**15-Sep-2023**	09-Mar-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW139_230911, 0089_MW141_230911, 0089_MW142_230911, 0089_MW149_230911, 0089_MW147_230911, 0089_QC307_230911, 0089_QC407_230911	**11-Sep-2023**	**14-Sep-2023**	09-Mar-2024	✓	**15-Sep-2023**	09-Mar-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	8	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	22	**9.09**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	8	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Stantec Australia	Contact Name [redacted]	Purchase Order : 304700525/730	COC Number : 304700525/730 -03
Office Address : GF, 226 Adelaide Terrace, Perth WA 6000		PROJECT Number : WA_0089_PFASOMP_23	Eurofins | mgt quote ID :
	Email for COC/SRN/Results : [redacted]	PROJECT Name : WA_0089_PFASOMP_23	Data output format: PDF; ESDAT

Special Directions & Comments :
Please send ESdat files to [redacted] with the project No in the header file

Please send invoice to [redacted]

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	PFAS (28 analytes)
1	0089_QC201_230904	4/09/2023	Water	X
2	0089_QC202_230904	4/09/2023	Water	X
3	0089_QC203_230904	4/09/2023	Soil	X
4	0089_QC204_230904	4/09/2023	Water	X
5	0089_QC205_230904	4/09/2023	Water	X
6	0089_QC206_230904	4/09/2023	Water	X
7	0089_QC207_230904	4/09/2023	Water	X
8	0089_QC208_230904	4/09/2023	Soil	X
9	0089_QC209_230904	4/09/2023	Water	X
10	0089_QC210_230904	4/09/2023	Water	X
11	0089_QC211_230904	4/09/2023	Soil	X
12	0089_QC212_230904	4/09/2023	Water	X
13	0089_QC213_230904	4/09/2023	Soil	X
14	0089_QC214_230905	5/09/2023	Water	X
15	0089_QC215_230905	5/09/2023	Water	X
16	0089_QC216_230905	5/09/2023	Water	X
17	0089_QC217_230905	5/09/2023	Water	X
18	0089_QC218_230905	5/09/2023	Water	X

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	

Sample comments:

Relinquished By: Stantec Australia	Laboratory Staff: Received By [redacted]	Turn around time	Method Of Shipment	Temperature on arrival: 10.9
Date & Time : 05/09/23	Date & Time : 5/9/23 16:00	1 DAY ☐ 2 DAY ☐ 3 DAY ☐	☑ Courier	Report number: 1023399
Signature:	Signature: [redacted]	STANDARD ☑ Other:	☐ Hand Delivered ☐ Postal	
			Courier Consignment # :	

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Sample Receipt Advice

Company name:	Stantec Australia Pty Ltd (WA)
Contact name:	[redacted]
Project name:	WA_0089_PFASOMP_23
Project ID:	WA_0089_PFASOMP_23
Turnaround time:	5 Day
Date/Time received	Sep 5, 2023 4:00 PM
Eurofins reference	1023399

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted] **on phone :** [redacted] **or by email:** [redacted]

Results will be delivered electronically via email to [redacted] - [redacted]

Note: A copy of these results will also be delivered to the general Stantec Australia Pty Ltd (WA) email address.

Global Leader - Results you can trust

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 30400525/730
Report #: 1023399
Phone: [redacted]
Fax:

Received: Sep 5, 2023 4:00 PM
Due: Sep 12, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_230904	Sep 04, 2023		Water	L23-Se0010240		X
2	0089_QC202_230904	Sep 04, 2023		Water	L23-Se0010241		X
3	0089_QC203_230904	Sep 04, 2023		Soil	L23-Se0010242	X	X
4	0089_QC204_230904	Sep 04, 2023		Water	L23-Se0010243		X
5	0089_QC205_230904	Sep 04, 2023		Water	L23-Se0010244		X
6	0089_QC206_230904	Sep 04, 2023		Water	L23-Se0010245		X
7	0089_QC207_230904	Sep 04, 2023		Water	L23-Se0010246		X
8	0089_QC208_230904	Sep 04, 2023		Soil	L23-Se0010247	X	X

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
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WA 6000

Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 30400525/730
Report #: 1023399
Phone: [redacted]
Fax:

Received: Sep 5, 2023 4:00 PM
Due: Sep 12, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0089_QC209_230904	Sep 04, 2023		Water	L23-Se0010248		X
10	0089_QC210_230904	Sep 04, 2023		Water	L23-Se0010249		X
11	0089_QC211_230904	Sep 04, 2023		Soil	L23-Se0010250	X	X
12	0089_QC12_230905	Sep 05, 2023		Water	L23-Se0010251		X
13	0089_QC213_230905	Sep 05, 2023		Soil	L23-Se0010252	X	X
14	0089_QC214_230905	Sep 05, 2023		Water	L23-Se0010253		X
15	0089_QC215_230905	Sep 05, 2023		Water	L23-Se0010254		X
16	0089_QC216_230905	Sep 05, 2023		Water	L23-Se0010255		X
17	0089_QC217_230905	Sep 05, 2023		Water	L23-Se0010256		X
18	0089_QC218_	Sep 05, 2023		Water	L23-Se0010257		X

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Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 30400525/730
Report #: 1023399
Phone: [redacted]
Fax:

Received: Sep 5, 2023 4:00 PM
Due: Sep 12, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
18	0089_QC218_230905	Sep 05, 2023		Water	L23-Se0010257		
Test Counts						4	18

Stantec Australia Pty Limited
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WA 6000

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Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **1023399-S**
Project name WA_0089_PFASOMP_23
Project ID WA_0089_PFASOMP_23
Received Date Sep 05, 2023

Client Sample ID			**0089_QC203_230904**	**0089_QC208_230904**	**0089_QC211_230904**	**0089_QC213_230905**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L23-Se0010242**	**L23-Se0010247**	**L23-Se0010250**	**L23-Se0010252**
Date Sampled			**Sep 04, 2023**	**Sep 04, 2023**	**Sep 04, 2023**	**Sep 05, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	19	29	15	32
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	83	62	63	56
13C5-PFPeA (surr.)	1	%	99	55	61	56
13C5-PFHxA (surr.)	1	%	104	67	81	70
13C4-PFHpA (surr.)	1	%	92	61	72	66
13C8-PFOA (surr.)	1	%	129	63	76	68
13C5-PFNA (surr.)	1	%	88	66	76	66
13C6-PFDA (surr.)	1	%	93	65	77	70
13C2-PFUnDA (surr.)	1	%	108	59	81	70
13C2-PFDoDA (surr.)	1	%	93	70	88	75
13C2-PFTeDA (surr.)	1	%	88	72	78	66
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			0089_QC203_230904	0089_QC208_230904	0089_QC211_230904	0089_QC213_230905
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L23-Se0010242**	**L23-Se0010247**	**L23-Se0010250**	**L23-Se0010252**
Date Sampled			**Sep 04, 2023**	**Sep 04, 2023**	**Sep 04, 2023**	**Sep 05, 2023**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	80	85	98	85
D3-N-MeFOSA (surr.)	1	%	113	86	99	91
D5-N-EtFOSA (surr.)	1	%	114	102	124	116
D7-N-MeFOSE (surr.)	1	%	100	84	99	84
D9-N-EtFOSE (surr.)	1	%	94	81	96	86
D5-N-EtFOSAA (surr.)	1	%	103	102	105	97
D3-N-MeFOSAA (surr.)	1	%	104	99	112	99
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	106	64	75	63
18O2-PFHxS (surr.)	1	%	109	65	74	65
13C8-PFOS (surr.)	1	%	92	63	76	73
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	79	60	74	68
13C2-6:2 FTSA (surr.)	1	%	118	68	79	67
13C2-8:2 FTSA (surr.)	1	%	120	84	102	85
13C2-10:2 FTSA (surr.)	1	%	121	112	119	112
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Sep 06, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Sep 07, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Sep 07, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Sep 07, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Sep 07, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Sep 06, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Stantec Australia Pty Ltd (WA)
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WA 6000

Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 30400525/730
Report #: 1023399
Phone: [redacted]
Fax:

Received: Sep 5, 2023 4:00 PM
Due: Sep 12, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_230904	Sep 04, 2023		Water	L23-Se0010240		X
2	0089_QC202_230904	Sep 04, 2023		Water	L23-Se0010241		X
3	0089_QC203_230904	Sep 04, 2023		Soil	L23-Se0010242	X	X
4	0089_QC204_230904	Sep 04, 2023		Water	L23-Se0010243		X
5	0089_QC205_230904	Sep 04, 2023		Water	L23-Se0010244		X
6	0089_QC206_230904	Sep 04, 2023		Water	L23-Se0010245		X
7	0089_QC207_230904	Sep 04, 2023		Water	L23-Se0010246		X
8	0089_QC208_230904	Sep 04, 2023		Soil	L23-Se0010247	X	X

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Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 30400525/730
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Received: Sep 5, 2023 4:00 PM
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Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0089_QC209_230904	Sep 04, 2023		Water	L23-Se0010248		X
10	0089_QC210_230904	Sep 04, 2023		Water	L23-Se0010249		X
11	0089_QC211_230904	Sep 04, 2023		Soil	L23-Se0010250	X	X
12	0089_QC12_230905	Sep 05, 2023		Water	L23-Se0010251		X
13	0089_QC213_230905	Sep 05, 2023		Soil	L23-Se0010252	X	X
14	0089_QC214_230905	Sep 05, 2023		Water	L23-Se0010253		X
15	0089_QC215_230905	Sep 05, 2023		Water	L23-Se0010254		X
16	0089_QC216_230905	Sep 05, 2023		Water	L23-Se0010255		X
17	0089_QC217_230905	Sep 05, 2023		Water	L23-Se0010256		X
18	0089_QC218_	Sep 05, 2023		Water	L23-Se0010257		X

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Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 30400525/730
Report #: 1023399
Phone: [redacted]
Fax:

Received: Sep 5, 2023 4:00 PM
Due: Sep 12, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
18	0089_QC218_230905	Sep 05, 2023		Water	L23-Se0010257		
Test Counts						4	18

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	95			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	102			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	90			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	97			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	92			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	91			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	108			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	119			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	106			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	91			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	110			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	102			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	108			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	85			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	94			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	104			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	92			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	93			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	88			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	94			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	78			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	90			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	96			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	76			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	108			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	95			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	100			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	105			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	97			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Se0015883	NCP	%	105			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0015883	NCP	%	78			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0015883	NCP	%	110			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0015883	NCP	%	109			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0015883	NCP	%	119			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0015883	NCP	%	126			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0015883	NCP	%	113			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0015883	NCP	%	127			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0015883	NCP	%	113			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0015883	NCP	%	127			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0015883	NCP	%	101			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Se0015883	NCP	%	106			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0015883	NCP	%	118			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0015883	NCP	%	102			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0015883	NCP	%	107			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0015883	NCP	%	100			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0015883	NCP	%	88			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0015883	NCP	%	108			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Se0015883	NCP	%	94			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0015883	NCP	%	112			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0015883	NCP	%	81			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0015883	NCP	%	86			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0015883	NCP	%	109			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0015883	NCP	%	91			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0015883	NCP	%	103			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0015883	NCP	%	114			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Se0015883	NCP	%	100			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0015883	NCP	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0015883	NCP	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0015883	NCP	%	95			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	B23-Se0009126	NCP	%	3.9	4.0	2.0	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0015882	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0015882	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0015882	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0015882	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS

[redacted]
[redacted]
General Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Stantec Australia Pty Limited
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WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **1023399-W-V2**
Project name WA_0089_PFASOMP_23
Project ID WA_0089_PFASOMP_23
Received Date Sep 05, 2023

Client Sample ID			**0089_QC201_230904**	**0089_QC202_230904**	**0089_QC204_230904**	**0089_QC205_230904**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L23-Se0010240**	**L23-Se0010241**	**L23-Se0010243**	**L23-Se0010244**
Date Sampled			**Sep 04, 2023**	**Sep 04, 2023**	**Sep 04, 2023**	**Sep 04, 2023**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	0.07	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	0.08	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]0.04	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]0.03	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	54	55	74	76
13C5-PFPeA (surr.)	1	%	96	93	87	95
13C5-PFHxA (surr.)	1	%	104	103	101	111
13C4-PFHpA (surr.)	1	%	87	88	89	97
13C8-PFOA (surr.)	1	%	106	99	108	108
13C5-PFNA (surr.)	1	%	78	72	89	90
13C6-PFDA (surr.)	1	%	68	61	77	94
13C2-PFUnDA (surr.)	1	%	70	53	87	80
13C2-PFDoDA (surr.)	1	%	73	54	87	80
13C2-PFTeDA (surr.)	1	%	77	60	73	53
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	96	96	105	106
D3-N-MeFOSA (surr.)	1	%	112	101	122	112

Client Sample ID			0089_QC201_230904	0089_QC202_230904	0089_QC204_230904	0089_QC205_230904
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Se0010240	L23-Se0010241	L23-Se0010243	L23-Se0010244
Date Sampled			Sep 04, 2023	Sep 04, 2023	Sep 04, 2023	Sep 04, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	111	95	120	104
D7-N-MeFOSE (surr.)	1	%	76	70	86	120
D9-N-EtFOSE (surr.)	1	%	81	62	95	81
D5-N-EtFOSAA (surr.)	1	%	67	56	92	86
D3-N-MeFOSAA (surr.)	1	%	69	54	88	86
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	[N09]0.02	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]0.26	[N09]0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	[N09]0.03	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]2.5	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	94	95	93	96
18O2-PFHxS (surr.)	1	%	84	82	86	88
13C8-PFOS (surr.)	1	%	70	59	71	77
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	92	84	93	111
13C2-6:2 FTSA (surr.)	1	%	83	75	91	97
13C2-8:2 FTSA (surr.)	1	%	63	54	77	81
13C2-10:2 FTSA (surr.)	1	%	78	60	96	82
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	2.76	0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	2.53	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	2.79	0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	2.99	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	3.04	< 0.1

Client Sample ID			0089_QC206_230904	0089_QC207_230904	0089_QC209_230904	0089_QC210_230904
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Se0010245	L23-Se0010246	L23-Se0010248	L23-Se0010249
Date Sampled			Sep 04, 2023	Sep 04, 2023	Sep 04, 2023	Sep 04, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			0089_QC206_230904	0089_QC207_230904	0089_QC209_230904	0089_QC210_230904
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Se0010245	L23-Se0010246	L23-Se0010248	L23-Se0010249
Date Sampled			Sep 04, 2023	Sep 04, 2023	Sep 04, 2023	Sep 04, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	68	62	53	63
13C5-PFPeA (surr.)	1	%	90	103	100	119
13C5-PFHxA (surr.)	1	%	104	109	108	128
13C4-PFHpA (surr.)	1	%	86	94	96	113
13C8-PFOA (surr.)	1	%	93	113	121	132
13C5-PFNA (surr.)	1	%	78	85	93	107
13C6-PFDA (surr.)	1	%	66	74	85	86
13C2-PFUnDA (surr.)	1	%	64	69	79	75
13C2-PFDoDA (surr.)	1	%	62	74	83	74
13C2-PFTeDA (surr.)	1	%	49	58	54	87
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	93	102	117	101
D3-N-MeFOSA (surr.)	1	%	130	106	119	94
D5-N-EtFOSA (surr.)	1	%	131	94	109	74
D7-N-MeFOSE (surr.)	1	%	75	94	115	85
D9-N-EtFOSE (surr.)	1	%	74	73	81	79
D5-N-EtFOSAA (surr.)	1	%	69	72	78	73
D3-N-MeFOSAA (surr.)	1	%	68	71	75	77
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.25	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.12	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	93	97	102	110
18O2-PFHxS (surr.)	1	%	77	86	94	110
13C8-PFOS (surr.)	1	%	66	68	79	87

Client Sample ID			0089_QC206_230904	0089_QC207_230904	0089_QC209_230904	0089_QC210_230904
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Se0010245	L23-Se0010246	L23-Se0010248	L23-Se0010249
Date Sampled			Sep 04, 2023	Sep 04, 2023	Sep 04, 2023	Sep 04, 2023
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	86	105	97	114
13C2-6:2 FTSA (surr.)	1	%	81	90	86	117
13C2-8:2 FTSA (surr.)	1	%	63	70	76	84
13C2-10:2 FTSA (surr.)	1	%	73	72	79	82
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.37	< 0.01	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.12	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.37	< 0.01	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.37	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	0.37	< 0.1	< 0.1	< 0.1

Client Sample ID			0089_QC212_230905	0089_QC214_230905	0089_QC215_230905	0089_QC216_230905
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Se0010251	L23-Se0010253	L23-Se0010254	L23-Se0010255
Date Sampled			Sep 05, 2023	Sep 05, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	0.07
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	0.01	0.01	0.14
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	0.05	0.05	0.52
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.29
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]0.09	[N09]1.4
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.03
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	63	67	66	76
13C5-PFPeA (surr.)	1	%	122	96	94	108
13C5-PFHxA (surr.)	1	%	128	112	109	106
13C4-PFHpA (surr.)	1	%	107	97	99	97
13C8-PFOA (surr.)	1	%	129	119	117	103
13C5-PFNA (surr.)	1	%	103	96	102	99
13C6-PFDA (surr.)	1	%	93	88	81	58
13C2-PFUnDA (surr.)	1	%	87	78	78	71
13C2-PFDoDA (surr.)	1	%	91	76	73	63
13C2-PFTeDA (surr.)	1	%	95	86	78	60

Client Sample ID			0089_QC212_230905	0089_QC214_230905	0089_QC215_230905	0089_QC216_230905
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-Se0010251	L23-Se0010253	L23-Se0010254	L23-Se0010255
Date Sampled			Sep 05, 2023	Sep 05, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	[N09]0.32
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	102	98	93	96
D3-N-MeFOSA (surr.)	1	%	109	162	85	104
D5-N-EtFOSA (surr.)	1	%	85	138	67	80
D7-N-MeFOSE (surr.)	1	%	113	74	62	74
D9-N-EtFOSE (surr.)	1	%	97	93	77	73
D5-N-EtFOSAA (surr.)	1	%	96	75	75	70
D3-N-MeFOSAA (surr.)	1	%	91	80	81	73
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	[N09]0.09	[N09]0.02	[N09]0.06
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.1
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	0.02	< 0.01	0.02
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	[N09]0.05	[N09]0.03	[N09]0.27
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	[N09]0.57	[N09]1.7	[N09]11
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	[N09]0.22	[N09]0.90
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	[N09]0.01	[N09]1.3	[N09]32
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.1
13C3-PFBS (surr.)	1	%	111	101	100	100
18O2-PFHxS (surr.)	1	%	103	95	101	98
13C8-PFOS (surr.)	1	%	88	89	92	92
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	0.11
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	135	94	110	119
13C2-6:2 FTSA (surr.)	1	%	122	101	107	112
13C2-8:2 FTSA (surr.)	1	%	99	83	85	80
13C2-10:2 FTSA (surr.)	1	%	113	90	88	74
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	0.58	3	43
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	0.01	1.39	33.4
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	0.58	3.09	44.4
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	0.73	3.17	45.59
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	0.8	3.42	47.13

Client Sample ID			0089_QC217_230905	0089_QC218_230905
Sample Matrix			Water	Water
Eurofins Sample No.			L23-Se0010256	L23-Se0010257
Date Sampled			Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.13	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	0.07	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	66	61
13C5-PFPeA (surr.)	1	%	96	111
13C5-PFHxA (surr.)	1	%	114	119
13C4-PFHpA (surr.)	1	%	103	96
13C8-PFOA (surr.)	1	%	128	100
13C5-PFNA (surr.)	1	%	107	74
13C6-PFDA (surr.)	1	%	95	56
13C2-PFUnDA (surr.)	1	%	88	50
13C2-PFDoDA (surr.)	1	%	87	50
13C2-PFTeDA (surr.)	1	%	84	70
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	106	70
D3-N-MeFOSA (surr.)	1	%	122	78
D5-N-EtFOSA (surr.)	1	%	90	65
D7-N-MeFOSE (surr.)	1	%	111	50
D9-N-EtFOSE (surr.)	1	%	92	59
D5-N-EtFOSAA (surr.)	1	%	86	51
D3-N-MeFOSAA (surr.)	1	%	89	54
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	[N09]0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.09	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.09	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01

Client Sample ID			0089_QC217_230905	0089_QC218_230905
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**L23-Se0010256**	**L23-Se0010257**
Date Sampled			**Sep 05, 2023**	**Sep 05, 2023**
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonic acids (PFSAs)				
13C3-PFBS (surr.)	1	%	105	101
18O2-PFHxS (surr.)	1	%	125	86
13C8-PFOS (surr.)	1	%	109	60
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	113	113
13C2-6:2 FTSA (surr.)	1	%	109	100
13C2-8:2 FTSA (surr.)	1	%	102	63
13C2-10:2 FTSA (surr.)	1	%	102	61
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	0.18	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.09	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.18	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.39	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	0.4	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Sep 08, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Sep 08, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Sep 08, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Sep 08, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Sep 06, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 30400525/730
Report #: 1023399
Phone: [redacted]
Fax:

Received: Sep 5, 2023 4:00 PM
Due: Sep 12, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_230904	Sep 04, 2023		Water	L23-Se0010240		X
2	0089_QC202_230904	Sep 04, 2023		Water	L23-Se0010241		X
3	0089_QC203_230904	Sep 04, 2023		Soil	L23-Se0010242	X	X
4	0089_QC204_230904	Sep 04, 2023		Water	L23-Se0010243		X
5	0089_QC205_230904	Sep 04, 2023		Water	L23-Se0010244		X
6	0089_QC206_230904	Sep 04, 2023		Water	L23-Se0010245		X
7	0089_QC207_230904	Sep 04, 2023		Water	L23-Se0010246		X
8	0089_QC208_230904	Sep 04, 2023		Soil	L23-Se0010247	X	X

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 30400525/730
Report #: 1023399
Phone: [redacted]
Fax:

Received: Sep 5, 2023 4:00 PM
Due: Sep 12, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0089_QC209_230904	Sep 04, 2023		Water	L23-Se0010248		X
10	0089_QC210_230904	Sep 04, 2023		Water	L23-Se0010249		X
11	0089_QC211_230904	Sep 04, 2023		Soil	L23-Se0010250	X	X
12	0089_QC12_230905	Sep 05, 2023		Water	L23-Se0010251		X
13	0089_QC213_230905	Sep 05, 2023		Soil	L23-Se0010252	X	X
14	0089_QC214_230905	Sep 05, 2023		Water	L23-Se0010253		X
15	0089_QC215_230905	Sep 05, 2023		Water	L23-Se0010254		X
16	0089_QC216_230905	Sep 05, 2023		Water	L23-Se0010255		X
17	0089_QC217_230905	Sep 05, 2023		Water	L23-Se0010256		X
18	0089_QC218_	Sep 05, 2023		Water	L23-Se0010257		X

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Received: Sep 5, 2023 4:00 PM
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Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
18	0089_QC218_230905	Sep 05, 2023		Water	L23-Se0010257		
Test Counts						4	18

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**µg/L:** micrograms per litre
ppm: parts per million	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	74			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	76			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	69			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	75			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	71			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	70			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	80			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	79			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	77			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	61			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	76			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	76			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	76			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	68			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	76			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	75			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	79			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	75			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	71			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	70			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	69			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	74			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	77			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	80			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	75			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	63			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	79			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	67			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorooctanesulfonic acid (PFOS)	M23-Se0019325	NCP	%	77			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L23-Se0010243	CP	%	87			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L23-Se0010243	CP	%	90			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L23-Se0010243	CP	%	80			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L23-Se0010243	CP	%	90			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L23-Se0010243	CP	%	90			50-150	Pass	
Perfluorononanoic acid (PFNA)	L23-Se0010243	CP	%	80			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L23-Se0010243	CP	%	101			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L23-Se0010243	CP	%	93			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L23-Se0010243	CP	%	92			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L23-Se0010243	CP	%	78			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L23-Se0010243	CP	%	87			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L23-Se0010243	CP	%	89			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L23-Se0010243	CP	%	80			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L23-Se0010243	CP	%	71			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L23-Se0010243	CP	%	130			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L23-Se0010243	CP	%	80			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L23-Se0010243	CP	%	92			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L23-Se0010243	CP	%	75			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L23-Se0010243	CP	%	79			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L23-Se0010243	CP	%	84			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L23-Se0010243	CP	%	68			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L23-Se0010243	CP	%	87			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L23-Se0010243	CP	%	86			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L23-Se0010243	CP	%	103			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L23-Se0010243	CP	%	75			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L23-Se0010243	CP	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L23-Se0010243	CP	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L23-Se0010243	CP	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L23-Se0010243	CP	%	71			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L23-Se0010241	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L23-Se0010241	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L23-Se0010241	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L23-Se0010241	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L23-Se0010241	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L23-Se0010241	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L23-Se0010241	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L23-Se0010241	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L23-Se0010241	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L23-Se0010241	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L23-Se0010256	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L23-Se0010256	CP	ug/L	0.13	0.13	2.4	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L23-Se0010256	CP	ug/L	0.07	0.06	4.8	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L23-Se0010256	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L23-Se0010256	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L23-Se0010256	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L23-Se0010256	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L23-Se0010256	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L23-Se0010256	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L23-Se0010256	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L23-Se0010256	CP	ug/L	0.01	0.01	1.1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L23-Se0010256	CP	ug/L	0.01	0.01	2.6	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L23-Se0010256	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L23-Se0010256	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

V2: Sample Se0010251 sample ID amended to 0089_QC212_230905

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager

[redacted] Senior Analyst-PFAS

[redacted]

[redacted]

General Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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APPENDIX

D

FIELD RECORDS & CALIBRATION CERTIFICATES

Cardno

now

Stantec

Date	Monitoring Location	Sample_ID	Screen Interval (mBGL)	TOC (mAHD)	Well Depth (m)	SWL (mbTOC)	RWL (mAHD)	Other Observations	Sampling Method	R1 - Temp (°C)	R1 - DO (mg/L)	R1 - EC (us/Cm)	R1 - TDS (mg/L)	R1 - pH	R1 - Eh (mV)
5/09/2023	MW109	0089_MW109_230905	2.5-5.5_	4.446	5.5	4.09	0.356		HydraSleeve	20.4	2.57	817	531	7.33	2.9
5/09/2023	MW112	0089_MW112_230905	3.0 - 6.0	3.973	6.0	3.45	0.523		HydraSleeve	21.3	1.13	526	342.1	7.56	-6.2
5/09/2023	MW120	0089_MW120_230905	2.5-5.5_	4.409	5.5	4.02	0.389		HydraSleeve	20	1.44	657	427.2	7.6	-0.9
5/09/2023	MW121	0089_MW121_230905	2.7-5.7_	3.7	5.7	3.31	0.39		HandBailing	20.2	5.84	604	3926	7.91	2.6
5/09/2023	MW123	0089_MW123_230905	4.5-8_	6.62	8.0	6.28	0.34		HydraSleeve	19.6	1.66	1393	905	7.54	-29.7
5/09/2023	MW124	0089_MW124_230905	0.75-4_	1.899	4.0	1.77	0.129		HydraSleeve	18	1.25	32781	24630	7.15	-105.9
5/09/2023	MW125	0089_MW125_230905	0.9-3.9_	1.882	3.9	1.75	0.132		HydraSleeve	20.4	0.66	35806	25512	7.13	-275.7
5/09/2023	MW126	0089_MW126_230905	0.9-3.9_	1.948	3.9	1.8	0.148		HydraSleeve	19.5	0.74	18622	13501	7.17	-249.2
5/09/2023	MW127	0089_MW127_230905	0.9-3.9_	1.771	3.9	1.63	0.141		HydraSleeve	18.5	0.28	30877	22939	7.11	-297.3
5/09/2023	MW128	0089_MW128_230905	2.5-5.5_	4.537	5.5	4.3	0.237		HandBailing	19.7	1.87	889	578	7.41	4
11/09/2023	MW139	0089_MW139_230911	2-5_	2.273	5.0	2.06	0.213		HydraSleeve	20.9	1.68	4034	2623	7.39	-22.9
11/09/2023	MW141	0089_MW141_230911	2-5_	3.025	5.0	2.6	0.425	Possible issues with dipper	HydraSleeve	20.4	1.69	28286	18396	6.73	-124.4
11/09/2023	MW142	0089_MW142_230911	0.25-4_	2.573	4.0	2.37	0.203		HydraSleeve	18.6	4.45	30127	19583	6.84	-72.2
11/09/2023	MW147	0089_MW147_230911	2-5_	3.423	5.2	3.2	0.223		HydraSleeve	20.5	3.43	9112	5922	6.86	-32.1
11/09/2023	MW149	0089_MW149_230911	1-4_	2.303	4.0	2.06	0.243		HydraSleeve	19.9	2.25	26455	17197	7.09	-22.4
4/09/2023	MW158	0089_MW158_230904	NA	14.541	15.82	14.18	0.361		HydraSleeve	19.3	4.1	7198	4679	7.33	-7.9
4/09/2023	MW161	0089_MW161_230904	NA	17.225	18.13	16.706	0.519		HydraSleeve	19.9	3.27	3443	2238	7.52	-12.2
4/09/2023	MW166	0089_MW166_230904	10-13_	11.89	13.0	11.235	0.655		HydraSleeve	18.9	4.08	3749	2437	7.34	-27.7
4/09/2023	MW171	0089_MW171_230904	28.5-31.5_	29.238	31.5	28.76	0.478		HydraSleeve	19.4	2.36	6989	4542	7.31	-31.3
4/09/2023	MW172							No access track, overgrown vegetation, high risk of snake encounter. Not sampled.							
4/09/2023	MW173	0089_MW173_230904	NA	10.08	11.11	9.63	0.45		HydraSleeve	21.3	2.2	4203	2727	7.16	-50.6
4/09/2023	MW193	0089_MW193_230904	10.5-13.5_	11.86	13.5	11.28	0.58		HydraSleeve	20.2	3.71	1741	1132	7.38	-20.8
4/09/2023	MW195D	0089_MW195D_230904	10-13_	4.363	13.0	3.99	0.373		HydraSleeve	20.3	1.86	26144	17008	7.35	-59.2
4/09/2023	MW195S		3.5-6.5_	4.571	6.5			Dry							
5/09/2023	MW196							Dry							
5/09/2023	MW197							Dry/blocked, unable to clear with steel bailer							
5/09/2023	MW199							Blocked/bent casing BGL							
5/09/2023	MW200	0089_MW200_230905	NA	2.07	NA	2.03	0.04		HandBailing	19.6	2.33	8461	5496	7.58	-48.9
5/09/2023	MW202	0089_MW202_230905	NA	2.12	NA	1.86	0.26		HydraSleeve	20.8	3.63	2255	1466	7.61	-44
5/09/2023	MW203	0089_MW203_230905	NA	10.855	12.9	10.55	0.305		HydraSleeve	21.7	2.67	2758	1922	7.87	-86.4
4/09/2023	MW214	0089_MW214_230904	5.5-9_	8.075	9.0	7.66	0.415	Insufficient volume remaining in sleeve to take field readings	HydraSleeve						
4/09/2023	MW215	0089_MW215_230904	1.5-4.5_	3.794	4.5	3.47	0.324	Insufficient volume remaining in sleeve for field readings	HydraSleeve						
4/09/2023	MW216	0089_MW216_230904	6-9_	8.329	6.0	7.87	0.459		HydraSleeve	19.4	2.54	2816	1831	7.26	-19
4/09/2023	MW217	0089_MW217_230904	6.5-9.5_	8.847	9.5	8.838	0.009		HydraSleeve	20.4	6.02	798	519	7.47	-20.2
4/09/2023	MW220	0089_MW220_230904				8.63		No borelog available	HydraSleeve	20.2	3.2	727	472	7.26	-18.8
4/09/2023	MW224	0089_MW224_230904	11.25-14.25_	13.372	14.25	12.99	0.382		HydraSleeve	20.3	9.55	13.9	8.9	7.85	-25.2
4/09/2023	MW225	0089_MW225_230904	2-5_	4.066	5.0	3.87	0.196		HydraSleeve	19.2	9.39	177	83	7.83	-2.8
4/09/2023	MW226	0089_MW226_230904	0.75-3.8_	1.749	3.8	1.66	0.089		HydraSleeve	19.6	2.66	41286	26855	7.12	-16.6
5/09/2023	MW227	0089_MW227_230905	1.25-4.2_	2.961	4.2	2.795	0.166		HydraSleeve	18.5	2.94	2912	1893	7.39	166.5
5/09/2023	MW228	0089_MW228_230905	0.75-3.75_	2.23	3.75	2.06	0.17	Ants in well	HydraSleeve	18.7	2.98	7084	4604	7.27	160.8
4/09/2023	MW233	0089_MW233_230904	NA	3.705	4.968				HydraSleeve	16.8	3.67	3004	195.3	7.88	-14.4
5/09/2023	MW236	0089_MW236_230905	NA	4.642	5.66	4.085	0.557	Shallow water. Bailer used	HandBailing	19.9	3.58	662	430.5	7.66	118.5
5/09/2023	MW238	0089_MW238_230905	NA	4.827	NA	4.31	0.517		HydraSleeve	20.1	1.61	347	225	7.55	-17.5
5/09/2023	MW239	0089_MW239_230905	NA	4.03	NA	3.53	0.5		HydraSleeve	20.1	3	758	493	7.55	-12.6
5/09/2023	MW240	0089_MW240_230905	NA	4.483	6.8	3.97	0.513		HydraSleeve	21.4	1.84	815	529	7.45	-22.2
4/09/2023	MW242	0089_MW242_230904	NA	3.539	4.76	3.085	0.454		HydraSleeve	21.3	3.51	249.7	162.2	7.84	-30.2
5/09/2023	MW243	0089_MW243_230905	NA	4.892	7.0	4.4	0.492		HydraSleeve	19.3	2.78	393	257	7.25	-19.8
5/09/2023	MW245	0089_MW245_230905	NA	4.551	5.65	4.08	0.471		HydraSleeve	20.2	3.26	430.7	280	7.3	-22.9
4/09/2023	MW249	0089_MW249_230904	3.5-6.5_	5.227	6.5	4.85	0.377		HydraSleeve	21.4	1.68	1396	909	7.43	-30.8
5/09/2023	MW255	0089_MW255_230905	3-6_	4.609	6.0	4.11	0.499		HydraSleeve	20.2	1.74	866	563	7.46	128.9
5/09/2023	MW256	0089_MW256_230905	3-6_	3.84	6.0	3.335	0.505		HydraSleeve	20.1	3.02	1273	827	7.2	132
5/09/2023	MW257	0089_MW257_230905	2.7-5.7_	3.806	5.7	3.34	0.466		HydraSleeve	20.2	7.15	321.6	209.2	8.1	116.5
5/09/2023	MW258	0089_MW258_230905	3-6_	4.043	6.0	3.58	0.463	Well blocked from 4.45 to 6m. Like tree roots. Bailer used for sampling - cleared with steel bailer and HydraSleeve re-installed.	HandBailing	21.1	2.73	1627	1058	7.39	143.6
5/09/2023	MW259	0089_MW259_230905	2.5-5.5_	3.8	5.5	3.63	0.17		HydraSleeve	19.7	2.06	992	645	7.28	96.6
4/09/2023	MW268	0089_MW268_230904	2.5-5.5_	4.056	5.5	3.845	0.211		HydraSleeve	20.7	1.1	14105	9166	7.26	-22.8
4/09/2023	MW269	0089_MW269_230904	2.5-5.5_	4.153	5.5	3.97	0.183		HydraSleeve	20.4	1.44	2071	1347	7.62	-143.2
4/09/2023	MW282		4.5-7.5_	5.78	7.5	5.36	0.42	Insufficient water for sample	HydraSleeve						
5/09/2023	MW288	0089_MW288_230905	2.25-5.25_	4.003	5.25	3.79	0.213		HydraSleeve	20.7	1.91	435.2	282.7	7.36	-18.2
4/09/2023	MW289	0089_MW289_230904	3.25-6.25_	4.495	6.25	4.045	0.45		HydraSleeve	21.8	1.09	802	521	7.53	-27.5
4/09/2023	MW496	0089_MW496_230904	3.5-8_	5.092	8.0	4.8	0.292		HydraSleeve	21.6	3.98	1207	785	7.26	-52.3
5/09/2023	MW500	0089_MW500_230905	2-6.5_	3.692	6.5	3.305	0.387		HydraSleeve	21.5	1.51	814	529	7.32	-1.2
4/09/2023	MW516	0089_MW516_230904	4.5-7.5_	6.37	7.5	6.055	0.315		HydraSleeve	21	1.15	1192	774	7.16	-48.7

Monitoring Location	R2 - Temp (°C)	R2 - DO (mg/L)	R2 - EC (us/Cm)	R2 - TDS (mg/L)	R2 - pH	R2 - Eh (mV)	R3 - Temp (°C)	R3 - DO (mg/L)	R3 - EC (us/Cm)	R3 - TDS (mg/L)	R3 - pH	R3 - Eh (mV)	QC Sample #	Odour	Colour
MW109															Clear
MW112													QC116/216		Clear
MW120													QC115/215		Clear
MW121	20.2	5.78	604	392.4	7.9	3.4	20.1	5.75	603	392	7.9	4.6			Cloudy
MW123													QC114/214		Cloudy
MW124															Clear
MW125															Clear
MW126															Clear
MW127														Hydrogen sulfide	Cloudy
MW128	19.6	1.83	888	577	7.42	3.9	19.6	1.81	888	577	7.42	1.9			Cloudy
MW139															Clear
MW141															Clear
MW142															Clear
MW147															Clear
MW149															Clear
MW158															Clear
MW161													QC104/204		Cloudy
MW166															Cloudy
MW171															Clear
MW172															
MW173															Clear
MW193															Cloudy
MW195D													QC105/205		Cloudy
MW195S															
MW196															
MW197															
MW199															
MW200	19.7	2.18	8436	5482	7.57	-47.9	19.7	2.14	8417	5469	7.57	-46.9			Cloudy
MW202															Clear
MW203															Clear
MW214														Stagnant	Clear
MW215														Stagnant	Clear
MW216															Clear
MW217															Clear
MW220															Clear
MW224															Clear
MW225															Clear
MW226															Clear
MW227															Clear,Green
MW228															Clear,Green
MW233															Clear
MW236															Clear
MW238															Clear
MW239															Clear
MW240															Clear
MW242															Clear
MW243															Clear
MW245															Clear
MW249													QC106/206		Clear
MW255															Clear
MW256															Clear
MW257															Clear
MW258															Clear,Cloudy
MW259													QC117/QC217		Cloudy,Clear
MW268															Clear
MW269															Clear
MW282															
MW288															Clear
MW289															Clear
MW496															Clear
MW500															Cloudy
MW516															Clear

Date	Monitoring Location	Sample_ID	Sample depth (m)	Sampling Method	R1 - Temp (°C)	R1 - DO (mg/L)	R1 - EC (us/Cm)	R1 - TDS (mg/L)	R1 - pH	R1 - Eh (mV)
5/09/2023	PW304	0089_PW304_230905	0.8	Peristaltic Pump	20.4	3.98	53717	34914	7.68	-104.4
4/09/2023	PW306	0089_PW306_230904	0.8	Peristaltic Pump	18.6	4.47	53566	34813	7.95	-22.3
4/09/2023	PW307	0089_PW307_230904	0.6	Peristaltic Pump	17.5	5.5	53520	34788	8.23	-33.7
4/09/2023	PW308	0089_PW308_230904	0.8	Peristaltic Pump	16.6	5.26	53745	34935	7.97	-33.9
4/09/2023	PW314	0089_PW314_230904	0.4	Peristaltic Pump	17.8	5.57	53435	34811	7.97	-22.6
4/09/2023	PW315	0089_PW315_230904	0.5	Peristaltic Pump	18.4	4.24	53639	34873	8.24	-33.7
4/09/2023	PW316	0089_PW316_230904	0.8	Peristaltic Pump	16.6	6.18	28431	18472	7.97	-34.3
11/09/2023	PW329	0089_PW329_230911	0.3	Peristaltic Pump	21.2	2	54665	35530	7.38	-28.7
11/09/2023	PW330	0089_PW330_230911	0.5	Peristaltic Pump	19.1	0.79	55150	35847	7.49	-29.8
11/09/2023	PW331	0089_PW331_230911	0.5	Peristaltic Pump	19.7	0.95	54505	35429	7.37	-39.3
5/09/2023	PW335	0089_PW335_230905	0.5	Peristaltic Pump	16.4	0.64	43172	33560	7.68	-199.1
5/09/2023	PW340	0089_PW340_230905	0.5	Peristaltic Pump	19	1.51	45523	33440	7.73	-102.4
5/09/2023	PW341	0089_PW341_230905	0.5	Peristaltic Pump	20.1	1.15	47754	34246	7.68	-126.1
5/09/2023	PW345	0089_PW345_230905	0.5	Peristaltic Pump	16.9	2.47	51492	33470	7.65	-115.1
5/09/2023	PW346	0089_PW346_230905	0.5	Peristaltic Pump	21.1	0.69	50743	32980	7.71	-143.5
5/09/2023	PW350	0089_PW350_230905	0.5	Peristaltic Pump	17.8	6.1	52499	34124	8.03	133.9
5/09/2023	PW351	0089_PW351_230905	0.5	Peristaltic Pump	17.4	6.82	52561	34165	8.06	125.5
5/09/2023	PW352	0089_PW352_230905	0.5	Peristaltic Pump	17.9	6.16	52844	34349	8.12	117.7
11/09/2023	PW356	0089_PW356_230911	0.2	Peristaltic Pump	19.4	0.98	54440	35380	7.43	-43.2
11/09/2023	PW357	0089_PW357_230911	0.2	Peristaltic Pump	18.8	0.96	55216	35890	7.48	-30.8
11/09/2023	PW358	0089_PW358_230911	0.4	Peristaltic Pump	20.1	2.4	54588	35456	7.35	-28.6
5/09/2023	PW362	0089_PW362_230905	0.5	Peristaltic Pump	19.1	1.31	46355	33915	7.74	-67.3
5/09/2023	PW363	0089_PW363_230905	0.5	Peristaltic Pump	19.5	1.53	28002	20319	7.79	-151.2
5/09/2023	PW364	0089_PW364_230905	0.5	Peristaltic Pump	16.8	0.77	43422	33437	7.67	-65.5
5/09/2023	PW367	0089_PW367_230905	0.5	Peristaltic Pump	17.2	1.36	51591	33532	7.63	-201.3
5/09/2023	PW368	0089_PW368_230905	0.2	Peristaltic Pump	19.9	3.95	53836	34990	7.53	-106.9
5/09/2023	PW369	0089_PW369_230905	0.5	Peristaltic Pump	17.8	1.5	53617	34867	7.62	-109.3
4/09/2023	PW374	0089_PW374_230904	0.2	Peristaltic Pump	15.5	5.22	53929	35051	8.03	-15.5
4/09/2023	PW375	0089_PW375_230904	0.2	Peristaltic Pump	17.5	4.9	52086	33858	7.94	-16.6
4/09/2023	PW378	0089_PW378_230904	0.2	Peristaltic Pump	16.2	6.63	53743	34915	8.04	17.5
5/09/2023	PW380	0089_PW380_230905	0.5	Peristaltic Pump	18.3	6.35	52727	34273	8.06	125.5
5/09/2023	PW381	0089_PW381_230905	0.5	Peristaltic Pump	18.7	6.46	51906	33739	8.11	113.1
5/09/2023	PW401	0089_PW401_230905	0.5	Peristaltic Pump	17.9	6.35	52668	34234	8.07	132.9
5/09/2023	PW405	0089_PW405_230905	0.5	Peristaltic Pump	18.5	2.48	52516	34137	7.76	108.3
5/09/2023	PW407	0089_PW407_230905	0.5	Peristaltic Pump	17.7	3.53	52424	34075	7.72	152.1
4/09/2023	PW409	0089_PW409_230904	0.5	Peristaltic Pump	18.7	2.07	53167	34561	7.71	-43.1
4/09/2023	PW411	0089_PW411_230904	0.5	Peristaltic Pump	16.5	2.88	54323	35309	7.72	-43.2
4/09/2023	PW413	0089_PW413_230904	0.5	Peristaltic Pump	16.6	2.75	53991	35091	7.77	-43.3
4/09/2023	PW415	0089_PW415_230904	0.5	Peristaltic Pump	16.2	3.41	54251	35263	7.75	-36

Monitoring Location	R2 - Temp (°C)	R2 - DO (mg/L)	R2 - EC (us/Cm)	R2 - TDS (mg/L)	R2 - pH	R2 - Eh (mV)	R3 - Temp (°C)	R3 - DO (mg/L)	R3 - EC (us/Cm)	R3 - TDS (mg/L)	R3 - pH	R3 - Eh (mV)	QC Sample #	Colour
PW304	20.4	3.98	53700	34903	7.71	-103.9	20.6	3.98	53684	34892	7.73	-103.3		Clear
PW306	18.7	4.53	53552	34820	7.95	-22.4	18.8	4.57	53532	34792	7.95	-22.5		Clear
PW307	17.5	4.75	53519	34782	8.24	-33.9	17.4	4.51	53499	34774	8.24	-33.3		Clear
PW308	16.6	5	53766	34949	7.97	-33.9	16.6	4.84	53786	34963	7.97	-34		Clear
PW314	18.1	4.61	53627	34865	7.95	-22.4	18.3	4.36	53604	34840	7.96	-22.3		Clear
PW315	18.4	4.21	53686	34899	8.24	-33.6	18.4	4.21	53686	34899	8.24	-33.6		Clear
PW316	16.7	5.69	28421	18471	7.97	-34.4	16.8	5.47	28394	18457	7.97	-34.4		Clear
PW329	21.4	1.97	54689	35554	7.39	-29	21.5	1.96	54708	35567	7.39	-29.1		Clear
PW330	19.1	0.79	55146	35845	7.49	-29.8	19.1	0.8	55143	35842	7.49	-29.8		Clear
PW331	19.8	0.95	54511	35433	7.36	-38.8	19.8	0.95	54514	35434	7.36	-38		Clear
PW335	16.4	0.62	43195	33569	7.68	-200.2	16.4	0.61	43212	33574	7.68	-200.9		Clear
PW340	19	1.48	45552	33432	7.73	-101.6	19	1.46	45574	33426	7.73	-100.8	QC118/218	Clear
PW341	20.1	1.16	47822	34249	7.68	-124.9	20.2	1.16	47868	34233	7.68	-124		Clear
PW345	16.9	2.35	51490	33469	7.65	-114.6	16.9	2.26	51486	33466	7.65	-113.9		Clear
PW346	21.9	0.84	50515	32830	7.71	-142.2	22.2	0.7	50518	32826	7.71	-141.1		Clear
PW350	17.8	6.12	52487	34116	8.03	133.7	17.8	6.11	52501	34126	8.03	133.8		Clear
PW351	17.4	6.81	52557	34161	8.06	125.4	17.4	6.83	52562	34166	8.06	125.5		Clear
PW352	18	6.14	52836	34341	8.11	117.2	17.9	6.15	52842	34347	8.12	117.6		Clear
PW356	19.5	0.97	54442	35389	7.43	-42.8	19.5	0.96	54448	35392	7.42	-42.3		Clear
PW357	18.8	0.92	55208	35884	7.48	-30.6	18.8	0.87	55199	35879	7.48	-30.4		Clear
PW358	20.5	2.2	54522	35438	7.37	-28.7	20.6	2.1	54546	35458	7.38	-28.7		Clear
PW362	19.2	1.28	46441	33926	7.74	-65.5	19.3	1.27	46528	33924	7.73	-64.5		Clear
PW363	19.6	1.52	28009	20307	7.79	-149.5	19.6	1.49	28015	20287	7.79	-147.8		Clear
PW364	16.8	0.74	43439	33450	7.67	-65.1	16.8	0.72	43454	33462	7.67	-64.2		Clear
PW367	17.3	1.32	51575	33522	7.63	-198.3	17.3	1.29	51563	33515	7.63	-195.4		Clear
PW368	20	3.95	53837	34990	7.56	-106.4	20.1	4.07	53800	34957	7.6	-106.4		Clear
PW369	17.8	1.46	53687	34901	7.62	-108.1	17.8	1.44	53682	34914	7.62	-106.8		Clear
PW374	15.5	4.94	53903	35032	8.03	-15.6	15.6	4.7	53872	35013	8.08	-15.5		Clear
PW375	18.4	4.35	52106	33867	7.94	-16.9	18.5	3.89	52140	33859	7.93	-16.9		Clear
PW378	16.4	5.33	53672	34879	8.04	-17.4	16.5	5.17	53629	34860	8.04	-17.4	QC102/202	Clear
PW380	18.4	6.33	52715	34264	8.05	123.2	18.3	6.36	52731	34276	8.06	126.1		Clear
PW381	18.8	6.45	51903	33731	8.11	113.1	18.7	6.44	51905	33740	8.11	113		Clear
PW401	17.9	6.36	52664	34232	8.07	132.7	17.9	6.32	52664	34228	8.07	132.9		Clear
PW405	18.5	2.37	52539	34151	7.75	102.2	18.6	2.27	52543	34153	7.76	98.5		Clear
PW407	17.7	3.29	52412	34067	7.72	151.8	17.7	3.12	52402	34061	7.72	151.6	QC112/212	Clear
PW409	19.2	1.85	53180	34571	7.71	-44.6	19.4	1.78	53181	34568	7.7	-45		Clear
PW411	16.6	2.76	54312	35303	7.71	-43.8	16.7	2.69	54308	35280	7.71	-44.1	QC110/210	Clear
PW413	16.6	2.67	53991	35094	7.77	-44.2	16.6	2.59	53996	35097	7.77	-44.8		Clear
PW415	16.3	3.3	54252	35265	7.75	-36.9	16.4	3.2	54258	35268	7.75	-37.5		Clear

Monitoring Area	Location	Date	Sample ID	Sampling Method	(m)	Depth (m)	Comments	Temp (°C)	DO (mg/L)	(us/Cm)	(mg/L)	pH	Eh (mV)	Water Colour	Turbidity
Fire Training Area	SW130	5/09/2023	0089_SW130_2309(	Direct_into_Bottle	0.1	1.0		16.9	4.45	42951	33023	7.95	66.9	Clear	Low
Fire Training Area	SW132	5/09/2023	0089_SW132_2309(	Direct_into_Bottle	0.1	1.0		21	3.79	48509	34135	8	-101.4	Clear	Low
Fire Training Area	SW134	5/09/2023	0089_SW134_2309(	Direct_into_Bottle	0.1	1.0		20.6	3.52	46943	33408	7.94	-136.4	Clear	Low
Demolition Ground	SW150	11/09/2023	0089_SW150_2309:	Direct_into_Bottle	0.1	1.0		21.9	3.02	54270	35315	7.66	-32.1	Clear	Low
Demolition Ground	SW152	11/09/2023	0089_SW152_2309:	Direct_into_Bottle	0.2	1.0		22	3.45	32757	21170	7.79	-26.2	Clear	Low
Demolition Ground	SW154	11/09/2023	0089_SW154_2309:	Direct_into_Bottle	0.1	1.0		24	6.46	54198	35244	7.65	-25.7	Clear	Low
Demolition Ground	SW156	11/09/2023	0089_SW156_2309:	Direct_into_Bottle	0.1	1.0		24	5.41	52200	33870	7.67	-24.7	Clear	Low
Waste Water Treatme	SW305	5/09/2023	0089_SW305_2309(	Direct_into_Bottle	0.1	1.0		21.3	6.95	50869	33058	7.92	-25.4	Clear	Low
Helicopter Support Fa	SW309	4/09/2023	0089_SW309_2309(	Direct_into_Bottle	0.1	1.0		18.5	6.38	26832	17441	8.19	-22.2	Clear	Low
Helicopter Support Fa	SW310	4/09/2023	0089_SW310_2309(	Direct_into_Bottle	0.1	1.0		18.8	5.66	52098	33835	8.21	-21.9	Clear	Low
Helicopter Support Fa	SW311	4/09/2023	0089_SW311_2309(	Direct_into_Bottle	0.1	1.0		19	5.75	52167	33909	8.2	-22.2	Clear	Low
Dredge Spoil / Careen	SW317	4/09/2023	0089_SW317_2309(	Direct_into_Bottle	0.1	1.0	QC101/201	17.7	5.9	52743	34464	8.1	-15.1	Clear	Low
Dredge Spoil / Careen	SW318	4/09/2023	0089_SW318_2309(	Direct_into_Bottle	0.1	1.0		18.2	6	53066	34486	8.18	-16.3	Clear	Low
Dredge Spoil / Careen	SW319	4/09/2023	0089_SW319_2309(	Direct_into_Bottle	0.1	1.0		17.6	6.1	53059	34490	8.17	-15.8	Clear	Low
Waste Water Treatme	SW353	5/09/2023	0089_SW353_2309(	Direct_into_Bottle	0.1	1.0		20	5.39	52808	34325	8.1	135.7	Clear	Low
Waste Water Treatme	SW370	5/09/2023	0089_SW370_2309(	Direct_into_Bottle	0.1	1.0		19.9	4.43	52837	34346	8.01	-36.6	Clear	Low
Waste Water Treatme	SW371	5/09/2023	0089_SW371_2309(	Direct_into_Bottle	0.1	1.0		21.5	4.3	50777	33003	7.92	-25.5	Clear	Low
Waste Water Treatme	SW372	5/09/2023	0089_SW372_2309(	Direct_into_Bottle	0.1	1.0		20.4	3.33	51345	33371	7.87	-97.3	Clear	Low
Waste Water Treatme	SW373	5/09/2023	0089_SW373_2309(	Direct_into_Bottle	0.1	1.0		20	3.29	51415	33432	7.86	-102.3	Clear	Low
Waste Water Treatme	SW382	5/09/2023	0089_SW382_2309(	Direct_into_Bottle	0.1	1.0		18.3	5.94	52621	34203	8.13	125.6	Clear	Low
Waste Water Treatme	SW383	5/09/2023	0089_SW383_2309(	Direct_into_Bottle	0.1	1.0		18.9	6.3	52319	33933	8.13	127	Clear	Low
Waste Water Treatme	SW384	5/09/2023	0089_SW384_2309(	Direct_into_Bottle	0.1	1.0		18.6	6.34	52579	34177	8.12	132.7	Clear	Low
Helicopter Support Fa	SW406	5/09/2023	0089_SW406_2309(	Direct_into_Bottle	0.15	1.0		18.4	5.42	52347	34026	8.08	94.7	Clear	Low
Helicopter Support Fa	SW408	5/09/2023	0089_SW408_2309(	Direct_into_Bottle	0.1	1.0		19	5.63	51084	33201	8.03	151	Clear	Low
Helicopter Support Fa	SW410	4/09/2023	0089_SW410_2309(	Direct_into_Bottle	0.1	1.0	QC107/207	21.9	5.13	53301	34650	8.11	-25.6	Clear	Low
Helicopter Support Fa	SW412	4/09/2023	0089_SW412_2309(	Direct_into_Bottle	0.1	1.0	QC109/209	20.1	4.52	53934	35068	8.21	-31.8	Clear	Low
Helicopter Support Fa	SW414	4/09/2023	0089_SW414_2309(	Direct_into_Bottle	0.1	1.0		20.5	4.95	53489	34784	8.19	-29.4	Clear	Low
Helicopter Support Fa	SW416	4/09/2023	0089_SW416_2309(	Direct_into_Bottle	0.1	1.0		20.8	4.55	53826	35000	8.13	-28.4	Clear	Low

Monitoring Location	Date	Sample ID	Comments	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description
SD378	4/09/2023	0089_SD378_230904	QC103/203	0.2	Shovel_Trowel	Wet	Sand
SD374	4/09/2023	0089_SD374_230904		0.2	Shovel_Trowel	Wet	Sand
SD375	4/09/2023	0089_SD375_230904		0.5	Shovel_Trowel	Wet	Sand
SD306	4/09/2023	0089_SD306_230904		0.4	Shovel_Trowel	Wet	Sand
SD314	4/09/2023	0089_SD314_230904		0.4	Shovel_Trowel	Wet	Sand
SD409	4/09/2023	0089_SD409_230904	QC108/208	0.8	Shovel_Trowel	Wet	Grey sand
SD415	4/09/2023	0089_SD415_230904		0.5	Shovel_Trowel	Wet	Beige coarse sand
SD413	4/09/2023	0089_SD413_230904		0.5	Shovel_Trowel	Wet	Beige coarse sand
SD411	4/09/2023	0089_SD411_230904	QC111/211	0.8	Shovel_Trowel	Wet	Beige coarse sand
SD308	4/09/2023	0089_SD308_230904		0.5	Shovel_Trowel	Wet	Beige sand
SD316	4/09/2023	0089_SD316_230904		0.5	Shovel_Trowel	Wet	Beige sand
SD307	4/09/2023	0089_SD307_230904		0.5	Shovel_Trowel	Wet	Beige sand
SD315	4/09/2023	0089_SD315_230904		0.5	Shovel_Trowel	Wet	Beige sand
SD407	5/09/2023	0089_SD407_230905		0.4	Shovel_Trowel	Wet	White SAND, fine to med grain, wet
SD405	5/09/2023	0089_SD405_230905		0.3	Shovel_Trowel	Wet	SAND, white and grey, fine to med grain, wet
SD346	5/09/2023	0089_SD346_230905		0.5	Shovel_Trowel	Wet	Sand
SD368	5/09/2023	0089_SD368_230905		0.2	Shovel_Trowel	Wet	Sand
SD304	5/09/2023	0089_SD304_230905		0.5	Shovel_Trowel	Wet	Sand
SD367	5/09/2023	0089_SD367_230905		0.5	Shovel_Trowel	Wet	Grey sand
SD345	5/09/2023	0089_SD345_230905		0.5	Shovel_Trowel	Wet	Grey sand
SD369	5/09/2023	0089_SD369_230905		0.8	Shovel_Trowel	Wet	Grey sand
SD350	5/09/2023	0089_SD350_230905		0.4	Shovel_Trowel	Wet	SAND, white yellow, fine to med grained
SD401	5/09/2023	0089_SD401_230905		0.5	Shovel_Trowel	Wet	SAND, white yellow, fine to med grained
SD380	5/09/2023	0089_SD380_230905		0.3	Shovel_Trowel	Wet	SAND, white yellow, fine to med grained
SD351	5/09/2023	0089_SD351_230905		0.4	Shovel_Trowel	Wet	SAND, white yellow, fine to med grained
SD381	5/09/2023	0089_SD381_230905		0.7	Shovel_Trowel	Wet	SAND, white yellow, fine to med grained
SD352	5/09/2023	0089_SD352_230905		0.6	Shovel_Trowel	Wet	SAND, white yellow, fine to med grained
SD335	5/09/2023	0089_SD335_230905		0.4	Shovel_Trowel	Wet	Sand, fine to med grained, well graded, grey to beige, trace organics
SD364	5/09/2023	0089_SD364_230905	QC113/213	0.3	Shovel_Trowel	Wet	Sand, fine to med grained, beige to grey, trace organics
SD363	5/09/2023	0089_SD363_230905		0.1	Shovel_Trowel	Wet	Sand, fine to med grained, grey, no odour, trace organics
SD341	5/09/2023	0089_SD341_230905		0.4	Shovel_Trowel	Wet	Sand, fine to med grained, beige to grey, trace organics
SD362	5/09/2023	0089_SD362_230905		0.5	Shovel_Trowel	Wet	Sand, fine to med grained, grey beige, trace organics
SD340	5/09/2023	0089_SD340_230905		0.1	Shovel_Trowel	Wet	Sand, fine to med grained, beige to grey, trace organics
SD356	11/09/2023	0089_SD356_230911		0.5	Shovel_Trowel	Wet	Sand
SD331	11/09/2023	0089_SD331_230911		0.5	Shovel_Trowel		Sand
SD357	11/09/2023	0089_SD357_230911		0.5	Shovel_Trowel	Wet	Sand
SD330	11/09/2023	0089_SD330_230911		0.5	Shovel_Trowel	Wet	Sand
SD329	11/09/2023	0089_SD329_230911		0.2	Shovel_Trowel	Wet	Sand
SD358	11/09/2023	0089_SD358_230911		0.2	Shovel_Trowel	Wet	Sand

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 22F101914
Cable length: 1m (22B100428)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	172.30 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.44
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 12 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (23D100040)	Check Temp NATA	Room Temp	16	0.1	°C	NA	16.1	°C
pH (22D)	pH 7.00	392512	7.01	-13.00	mV	7.1	7.01	pH
pH (22D)	pH 4.00	394799	4.00	159.30	mV	4.04	4.00	pH
Conductivity (23D100040)	2764 µs/cm at 25°C	23/0402	2764	GLP	4.91	2815	2764	µs/cm
ORP (22B)	Zobell A & B	23/2504	249	249	mV	229.6	236.1	mV
Zero DO (22A100300)	NaSO3 in distilled water	10175	0.0	NA	NA	0.3	0.0	%
100% DO (22A100300)	100% Air Saturation	Air	100.0	4.1	uA	90.4	100.0	%

Calibrated by: [redacted]

Calibration Date: 12-Aug-23
Next Due: 08-Feb-24

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 22B104437
Cable length: 1m (22B100428)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	172.60 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.52
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 12 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (22B100315)	Check Temp NATA	Room Temp	16.8	0	°C	NA	16.8	°C
pH (22B)	pH 7.00	392512	7.01	-27.70	mV	7.04	7.01	pH
pH (22B)	pH 4.00	394799	4.00	144.90	mV	4	4.00	pH
Conductivity (22B100315)	2764 µs/cm at 25°C	23/0402	2764	GLP	5.03	2756	2764	µs/cm
ORP (22A)	Zobell A & B	23/2404	247	247	mV	236.9	235.1	mV
Zero DO (22B100173)	NaSO3 in distilled water	10175	0.0	NA	NA	1	0.0	%
100% DO (22B100173)	100% Air Saturation	Air	100.0	4.7	uA	95.8	100.0	%

Calibrated by [redacted]

Calibration Date: 23-Aug-23
Next Due: 19-Feb-24

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 22C103026
Cable length: 1m (22B100428)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	172.70 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.67
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 13 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (22B100315)	Check Temp NATA	Room Temp	15.5	-0.1	°C	NA	15.4	°C
pH (22D)	pH 7.00	392512	7.01	-17.20	mV	7.07	7.01	pH
pH (22D)	pH 4.00	394799	4.00	155.50	mV	4.02	4.00	pH
Conductivity (22B100315)	2764 µs/cm at 25°C	23/0402	2764	GLP	4.93	2835	2764	µs/cm
ORP (22B)	Zobell A & B	23/2504	250	250	mV	254.5	237.2	mV
Zero DO (22E100254)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.7	0.0	%
100% DO (22E100254)	100% Air Saturation	Air	100.0	3.1	uA	79.2	100.0	%

Calibrated by: [redacted]

Calibration Date: 12-Aug-23
Next Due: 08-Feb-24

Stantec

Calibration Report

Multi-Parameter Water Quality Instrument

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 21G105325
Cable length: 4m (21F100778)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	needs spare
	Battery Saver	✓	
Connections	Condition	✓	
Cable	Condition	✓	
Display	Operation	✓	
Firmware	Version	✓	
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition		
pH		✓	
Condition		✓	
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	
pH slope		✓	
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP		✓	
Condition		✓	
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	
Conductivity		✓	
Condition		✓	
Temperature		✓	
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications			µs/cm
Dissolved Oxygen		✓	
Condition			Good, clean
DO sensor in use			Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

Parameter	Standards	Calibration Point	Units	Instrument Readings: Before		After		Units
Temperature	Check Temp NATA		°C	NA				°C
pH 21G	pH 7.00	7.01	mV	7.01		7.0		pH
pH 21G	pH 4.00 4.13	4.00	mV	4.12		4.0		pH
Conductivity (21H100008) 1413	2768 µs/cm at 25°C	2768 1413	5.03	1312		1413		µs/cm
ORP (Reference check only) 21O	Zobell A & B	235	mV	235		235		mV
Zero DO (21G100131)	NaSO3 in distilled water	0.0	NA	0.02		0.0		%
100% DO (21G100131)	100% Air Saturation	100.0	uA	100		100		%

Calibrated by: [redacted]

Calibration Date: 26/8/23

Date of Bump Test	Site ID	Unit Brand/ Model	Ambient Air Oxygen Calibration	Zero % Oxygen Solution Calibration	Standard Concentrations	Ambient Temperature (°C)	Bump Test Reading	Bump Test Readings within ±5%?	Comment	Test by (Name)	(Signature)
5/9/23	0089	YSI #22C103026	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N	16.8	pH 4.00: 4.20 pH 7.00: 7.18 EC: 1494	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) / N		[redacted]	
5/9/23	0089	YSI # 22B104437	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: 1,413µS/cm (Y) / N	16.8	pH 4.00: 4.01 pH 7.00: 7.1 EC: 1480	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) N			
5/9/23	0089	YSI #22F101914	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N	16.2	pH 4.00: 4.01 pH 7.00: 7.05 EC: 1488	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) N			
5/9/23	0089	YSI # 21605525	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: 1,413µS/cm (Y) N	16.5	pH 4.00: 4.05 pH 7.00: 7.03 Temp: 1,476 EC:	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) / N	None.		
11/9/23	0089	YSI # 22B104431	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 Y / N EC: 1,413µS/cm (Y) / N	18.8	pH 4.00: 4.04 pH 7.00: 7.1 Temp: EC: 1480	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) / N	—		
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			

APPENDIX

E

DATA QUALITY REVIEW

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Data Quality Review
PFAS Ongoing Monitoring Plan
Q3 2023 Monitoring Event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as trip blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

QA/QC Aspects	Evidence & Evaluation
	QA Documentation
Project Quality Plan/Work Plan and Data Quality Objectives	The field investigation was carried out on the 4th 5th and 11th of September 2023 and is generally in accordance with the proposed scope of work, as documented in the SAQP (PFAS OMP SAQP HMAS Stirling, Cardno, August 2023, Rev11) issued to the client and in general compliance with Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling,* NEPM "*National Environment Protection (Assessment of Site Contamination) Measure"* and PFAS NEMP 2.0. A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (PFAS OMP Q3 2023 Factual Report). In addition, a safety, health and environment work method statement (SHEWMS) was also prepared. The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.
	Data Representativeness
Use of Composites	No Composites were used during the investigation
Holding Times	Chain of custody and laboratory reports provide evidence of holding times. Holding times generally complied with required timeframes, with the following exception: ▪ Dissolved Major Cations (EP2312170, EP2312177, EP2312178, EP2312183, EP2312184, EP2312187, EP2312188, EP2312525, EP2312528) – 1 day overdue, (EP2312225, EP2312228) – 2 days overdue. The holding time exceedance for a minority of results are likely due to the laboratory workload. They are not considered to have adversely impacted the reliability of the results obtained, or the conclusions drawn from this assessment. The samples were chilled in eskies with ice and placed into fridges upon receipt by the laboratory.
Verification of field procedures	The methodology conducted during this investigation is documented in the body of the report and was in general conformance with the SAQP. Non-disposable equipment was decontaminated between sample locations.
Laboratory Reports	The following laboratory reports were considered for this data quality review: ▪ ALS reports: EP2312170, EP2312171, EP2312172, EP2312177, EP2312178, EP2312180, EP2312183, EP2312184, EP2312186, EP2312187, EP2312188, EP2312190, EP2312225, EP2312228, EP2312525, EP2312526, EP2312528. ▪ Eurofins report: 1023399

<table>
<tr><th>QA/QC Aspects</th><th>Evidence & Evaluation</th></tr>
<tr><td colspan="2">Data Precision & Accuracy</td></tr>
<tr><td>QC sample Frequency</td><td>
<table>
<tr><th>QC sample type</th><th>SAQP required frequency</th><th>Sample Collected</th></tr>
<tr><td>Blind duplicate</td><td>1 in 10 primary samples (10%)</td><td>7 for 56 groundwater samples (12.5%)
4 for 39 porewater samples (10.3%)
3 in 27 surface water samples (10.7%)
4 in 39 sediment samples (10.3%)</td></tr>
<tr><td>Interlab duplicate</td><td>1 in 10 primary samples (10%)</td><td>7 for 56 groundwater samples (12.5%)
4 for 39 porewater samples (10.3%)
3 in 28 surface water samples (10.7%)
4 in 39 sediment samples (10.3%)</td></tr>
<tr><td>Rinsate</td><td>1 per field crew per day</td><td>7 for 3 days (1 to 4 field personnel/day) (100%)</td></tr>
<tr><td>Field Blank</td><td>1 per field crew per day</td><td>7 for 3 days (1 to 4 field personnel/day) (100%)</td></tr>
</table>
The required QC frequency was achieved for all sample types.</td></tr>
<tr><td>RPD Acceptance criteria</td><td>
<table>
<tr><th>Magnitude of Results</th><th>Acceptable RPD range</th></tr>
<tr><td>< 10 x LOR</td><td>No limits</td></tr>
<tr><td>10 – 20 LOR</td><td>0% - 50%</td></tr>
<tr><td>> 20 x LOR</td><td>0% - 20%</td></tr>
</table></td></tr>
<tr><td>QC Testing – Blind Duplicates (Primary Lab)</td><td>Groundwater
▪ Primary Groundwater Samples Analysed: 56
▪ Blind Duplicate Samples Analysed: 7
RPDs were within acceptance criteria.
Porewater
▪ Primary porewater Samples Analysed: 39
▪ Blind Duplicate Samples Analysed: 4
All RPDs were within acceptance criteria.
Surface water
▪ Primary surface water Samples Analysed: 28
▪ Blind Duplicate Samples Analysed: 3
All RPDs were within acceptance criteria.
Sediment
▪ Primary Sediment Samples Analysed: 39
▪ Blind Duplicate Samples Analysed: 4
All RPDs were within acceptance criteria.</td></tr>
<tr><td>QC Testing – Interlab Duplicates (Secondary Lab)</td><td>Groundwater
▪ Primary Groundwater Samples Analysed: 56
▪ Interlab Duplicate Samples Analysed: 7
RPDs were within acceptance criteria with the following exceptions:
▪ QC215 (PFHpS – 24%)</td></tr>
</table>

QA/QC Aspects	Evidence & Evaluation
	▪ QC216 (PFHpS – 46%, PFHxA – 46%) These RPDs difference are likely due to the differences of methodologies between the primary and secondary laboratories and/or low concentrations of analytes under review. Concentrations were higher for the primary sample (conservative value reported on). This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Porewater*** ▪ Primary porewater Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria. ***Surface water*** ▪ Primary surface water Samples Analysed: 28 ▪ Interlab Duplicate Samples Analysed: 3 All RPDs were within acceptance criteria. ***Sediment*** ▪ Primary sediment Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria.
Field Blanks	Field Blanks were collected at a rate of one per fieldwork day per field personnel. All field blank samples tested reported analytes below the laboratory limit of reporting.
Laboratory Internal QC	Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, matrix spikes, laboratory control samples and laboratory duplicates. All Method Blank, Laboratory Control and surrogate recovery results were within acceptable range. All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following: ▪ EP2312228: - .Total Alkalinity recovery greater than upper control limit. ▪ EP2312172, EP2312178, EP2312183, EP2312184, EP2312187, EP2312225: - Samples ID: Anonymous, PW367, PW346, PW378: Sulfate and Chloride matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level. ▪ EP2312170, EP2312172, EP2312177, EP2312225, EP2312228: - Samples ID: QC115, Anonymous, PW367, MW173: PFHxS and PFOS matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level. ▪ EP2312178, EP2312183, EP2312187: - Samples ID: Anonymous, MW228: PFPeA, PFHxA and PFHpA matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level. ▪ EP2312526: - Sample ID: Anonymous: PFOS matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. The following quality control samples frequency outliers were reported: ▪ EP2312184, EP2312188, EP2312525, EP2312528: - Laboratory Duplicates: PFAS by LCMSMS, expected frequency 10% not achieved. ▪ EP2312170, EP2312172, EP2312177, EP2312178, EP2312225, EP2312228: - Laboratory Duplicates: PFAS by LCMSMS, expected frequency 10% not achieved. - Matrix Spikes: PFAS by LCMSMS, expected frequency 5% not achieved.

QA/QC Aspects	Evidence & Evaluation
	The above outliers/exceptions are not considered to affect the reliability of the dataset.
Laboratory Method Detection Limit	Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.
NATA endorsement of laboratory reports	Laboratory reports were stamped with the NATA endorsement stamp and signature. ALS Accreditation No. 825 Eurofins ARL Accreditation No. 1261
Calibration of Field Equipment	All equipment used during the investigation was calibrated by the supplier prior to use and daily readings of reference solutions (bump tests) were completed. The equipment calibration certificates, and daily field bump test records are provided in Appendix D.
Decontamination and Equipment Blanks	Rinsate blanks were collected at a rate of one per day per field personnel when reusable equipment was used. All rinsate samples tested reported analytes concentrations below the laboratory LORs.
Data Comparability	
Standard Procedures	Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.
Qualified Personnel	Staff involved in managing and reviewing the project and those involved in fieldwork are experienced and qualified personnel.
Sample Integrity	Field Chain of Custody/Laboratory request forms can be found in Appendix C.
Data Completeness	
Completeness of test program	The scope of work undertaken was generally consistent with the SAQP.
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection process and therefore, the data set used as the basis for groundwater, surface water, porewater and sediment investigation is considered valid and complete.

APPENDIX

D

DATA ASSESSMENT

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						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
FTA	**MW109**	**08 Mar 2017**	**0089_MW109_S_170803**	**Normal**	**199045**	0.21	0.42	7.7	0.41	1.1	<0.002	0.077	0.13	0.99	0.11	0.47	0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW109**	**20 Sep 2017**	**0089_MW109_D_170920**	**Normal**	**176250**	0.37	0.58	14	1.0	1.8	<0.002	0.11	0.26	1.3	0.13	*0.61*	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW109**	**20 Sep 2017**	**0089_MW109_S_170920**	**Normal**	**176250**	0.37	0.63	13	0.96	1.3	<0.002	0.10	0.25	1.5	0.14	*0.58*	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW109**	**18 Oct 2017**	**0089_MW109_D_171018**	**Normal**	**178113**	0.24	0.47	17	0.88	2.5	<0.02	0.12	0.26	1.6	0.20	*0.73*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02
FTA	**MW109**	**18 Oct 2017**	**0089_MW109_S_171018**	**Normal**	**178113**	0.23	0.46	17	0.85	2.4	<0.02	0.12	0.26	1.7	0.20	*0.75*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02
FTA	**MW109**	**16 Nov 2017**	**0089_MW109_D_171116**	**Normal**	**203411**	0.22	0.43	15	0.46	1.8	<0.02	0.11	0.23	1.7	0.20	*0.64*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02
FTA	**MW109**	**16 Nov 2017**	**0089_MW109_S_171116**	**Normal**	**203411**	0.22	0.41	16	0.40	1.8	<0.02	0.10	0.21	1.6	0.19	*0.61*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02
FTA	**MW109**	**06 Dec 2017**	**0089_MW109_D_171206**	**Normal**	**204243**	0.19	0.37	15	0.48	1.5	<0.002	0.084	0.28	1.3	0.14	0.53	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW109**	**06 Dec 2017**	**0089_MW109_S_171206**	**Normal**	**204243**	0.19	0.38	15	0.40	1.3	<0.002	0.074	0.23	1.3	0.11	0.50	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW109**	**18 Jan 2018**	**0089_MW109_D_180118**	**Normal**	**205797**	0.21	0.56	15	0.71	2.4	<0.002	0.12	0.19	1.5	0.21	0.54	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW109**	**18 Jan 2018**	**0089_MW109_S_180118**	**Normal**	**205797**	0.21	0.58	16	0.68	2.4	<0.002	0.12	0.19	1.6	0.21	0.53	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW109**	**16 Dec 2019**	**0089_MW109_191216**	**Normal**	**EP1913380**	0.29	0.58	10.5	0.91	8.96	<0.02	0.4	0.30	1.63	0.20	0.55	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**30 Mar 2020**	**0089_MW109_200330**	**Normal**	**EP2003333**	0.24	0.38	6.60	0.37	4.75	<0.02	<0.1	0.11	0.98	0.08	0.32	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**15 Jul 2020**	**0089_MW109_200715**	**Normal**	**EP2007385**	0.16	0.41	7.18	0.75	6.89	<0.02	<0.1	0.17	0.99	0.14	0.46	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**15 Jul 2020**	**0089_QC105_200715**	**Field Duplicate**	**EP2007385**	0.18	0.48	8.67	0.94	8.64	<0.02	<0.1	0.18	1.11	0.14	0.52	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**15 Jul 2020**	**0089_QC205_200215**	**Interlab Duplicate**	**732844**	0.12	0.21	5.6	0.30	5.5	<0.01	0.08	0.11	0.75	0.12	0.28	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW109**	**21 Sep 2020**	**0089_MW109_200921**	**Normal**	**EP2010093**	0.18	0.48	11.7	1.22	9.59	<0.02	0.1	0.24	1.31	0.16	*0.63*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**14 Dec 2020**	**0089_MW109_201214**	**Normal**	**EP2013984**	0.12	0.31	8.32	1.10	10.0	<0.02	0.1	0.22	1.31	0.15	0.48	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**14 Dec 2020**	**0089_QC108_201214**	**Field Duplicate**	**EP2013984**	0.12	0.34	8.68	1.20	10.1	<0.02	0.1	0.23	1.36	0.16	*0.67*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**14 Dec 2020**	**0089_QC208_201114**	**Interlab Duplicate**	**765054**	0.12	0.33	9.0	0.64	11	<0.01	0.14	0.21	1.1	0.16	*0.67*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW109**	**16 Mar 2021**	**0089_MW109_210316**	**Normal**	**EP2102833**	0.34	0.58	3.64	0.22	3.72	<0.02	<0.1	0.10	0.62	0.06	0.18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**08 Jun 2021**	**0089_MW109_210608**	**Normal**	**EP2106448**	0.43	0.94	15.2	1.99	38.0	<0.02	0.2	0.64	3.70	0.25	*0.94*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**30 Aug 2021**	**0089_MW109_210830**	**Normal**	**EP2110020**	0.13	0.28	3.28	0.18	1.59	<0.02	<0.1	0.09	0.46	0.06	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**14 Mar 2022**	**0089_MW109_220314**	**Normal**	**EP2202975**	0.22	0.68	6.84	0.42	3.42	<0.02	0.1	0.19	1.41	0.12	0.38	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**14 Mar 2022**	**0089_QC106_220314**	**Field Duplicate**	**EP2202975**	0.21	0.37	5.61	0.38	3.04	<0.02	0.1	0.17	1.29	0.12	0.35	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**14 Mar 2022**	**0089_QC206_220314**	**Interlab Duplicate**	**872911**	0.18	0.42	5.5	0.24	3.1	<0.01	0.12	0.12	0.86	0.08	0.30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW109**	**07 Jun 2022**	**0089_MW109_220607**	**Normal**	**EP2206880**	0.14	0.36	6.15	0.52	4.64	<0.02	<0.1	0.15	0.81	0.09	0.29	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**07 Jun 2022**	**0089_QC107_220607**	**Field Duplicate**	**EP2206880**	0.15	0.35	5.70	0.50	4.47	<0.02	<0.1	0.16	0.81	0.08	0.28	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**07 Jun 2022**	**0089_QC207_220607**	**Interlab Duplicate**	**896805**	0.14	0.29	4.0	0.38	2.3	<0.004	0.085	0.12	0.63	0.078	0.22	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.008	0.010	<0.002	<0.004	<0.004	<0.004	<0.004
FTA	**MW109**	**05 Sep 2022**	**0089_MW109_220905**	**Normal**	**EP2211343**	0.06	0.14	0.53	<0.02	0.08	<0.02	<0.1	<0.02	0.09	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**05 Sep 2022**	**0089_QC117_220905**	**Field Duplicate**	**EP2211343**	0.06	0.14	0.53	<0.02	0.09	<0.02	<0.1	<0.02	0.08	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**05 Sep 2022**	**0089_QC217_220905**	**Interlab Duplicate**	**920981**	0.06	0.09	0.32	0.01	0.07	<0.01	<0.05	<0.01	0.05	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW109**	**12 Dec 2022**	**0089_MW109_221212**	**Normal**	**EP2216902**	0.08	0.13	0.62	<0.02	0.24	<0.02	<0.1	<0.02	0.07	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**13 Mar 2023**	**0089_MW109_230313**	**Normal**	**EP2303119**	0.14	0.22	1.66	0.04	0.44	<0.02	0.1	0.03	0.27	0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**13 Mar 2023**	**0089_QC107_230313**	**Field Duplicate**	**EP2303119**	0.14	0.20	1.34	0.04	0.42	<0.02	0.1	0.02	0.24	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**13 Mar 2023**	**0089_QC207_230313**	**Interlab Duplicate**	**972487**	0.13	0.24	1.3	0.03	0.44	<0.01	0.13	0.03	0.21	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW109**	**06 Jun 2023**	**0089_MW109_230606**	**Normal**	**EP2307463**	0.13	0.23	1.73	0.03	0.40	<0.02	0.1	0.02	0.24	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW109**	**05 Sep 2023**	**0089_MW109_230905**	**Normal**	**EP2312170**	0.06	0.14	2.04	0.07	0.53	<0.02	<0.1	0.03	0.26	0.03	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW112**	**30 Oct 2010**	**DS3-MB01**	**Normal**	**EP1005976**					16.4						*5.18*													
FTA	**MW112**	**22 Oct 2013**	**WA0001_D53_MB01**	**Normal**	**EP1308039**					41.5						*1.84*								0.1					
FTA	**MW112**	**26 May 2015**	**D53_MB01**	**Normal**	**EP1510572**					38.5						*2.26*								<0.1	<0.1				
FTA	**MW112**	**29 Sep 2015**	**WA0001_MB01**	**Normal**	**EP1514335**					7.41						*3.02*								<0.1	<0.1				
FTA	**MW112**	**23 Feb 2016**	**D53_MB01**	**Normal**	**EP1601568**					20.7						*2.05*								<0.1	<0.1				
FTA	**MW112**	**25 Oct 2016**	**D53_MB01**	**Normal**	**521581**					43						*2.6*								0.2					
FTA	**MW112**	**25 Oct 2016**	**QC102**	**Field Duplicate**	**521581**					29						*2.6*								0.2					
FTA	**MW112**	**25 Oct 2016**	**QC202**	**Interlab Duplicate**	**521581**					31						*2.2*								0.11					
FTA	**MW112**	**08 Mar 2017**	**0089_MW112_S_170803**	**Normal**	**199045**	0.28	0.79	21	1.5	26	<0.002	0.16	0.46	2.3	0.6	*3.1*	0.027	0.003	<0.002	<0.005	<0.01	<0.05	<0.001	0.073	0.004	<0.001	0.48	<0.005	<0.002
FTA	**MW112**	**20 Sep 2017**	**0089_MW112_D_170920**	**Normal**	**176250**	0.49	1.1	25	3.5	1.2	<0.002	0.18	0.30	2.4	0.51	*3.3*	0.028	0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.069	0.002	<0.001	0.25	<0.005	<0.002
FTA	**MW112**	**20 Sep 2017**	**0089_MW112_S_170920**	**Normal**	**176250**	0.17	0.55	13	1.9	1.6	<0.002	0.11	0.19	1.2	0.32	*1.8*	0.034	0.003	<0.002	<0.005	<0.01	<0.05	<0.001	0.087	0.003	<0.001	0.49	<0.005	<0.002
FTA	**MW112**	**18 Oct 2017**	**0089_MW112_D_171018**	**Normal**	**178113**	0.24	0.59	24	2.3	29	<0.02	0.14	0.41	2.1	0.51	*2.9*	0.028	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	0.086	<0.01	<0.01	0.31	0.005	<0.02
FTA	**MW112**	**18 Oct 2017**	**0089_MW112_S_171018**	**Normal**	**178113**	0.17	0.46	19	1.6	38	<0.02	0.12	0.34	1.5	0.44	*2.2*	0.032	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	0.11	0.010	<0.01	0.42	0.02	<0.02
FTA	**MW112**	**16 Nov 2017**	**0089_MW112_D_171116**	**Normal**	**203411**	0.18	0.43	16	1.2	21	<0.02	0.12	0.33	1.8	0.50	*2.4*	0.020	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	0.070	<0.01	<0.01	0.40	<0.05	<0.02
FTA	**MW112**	**16 Nov 2017**	**0089_MW112_S_171116**	**Normal**	**203411**	0.099	0.20	9.9	0.63	27	<0.02	0.10	0.20	1.1	0.44	*1.9*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	0.054	<0.01	<0.01	0.48	<0.05	<0.02
FTA	**MW112**	**06 Dec 2017**	**0089_MW112_D_171206**	**Normal**	**204243**	0.17	0.41	16	1.2	25	<0.02	0.13	0.43	1.8	0.40	*2.5*	0.031	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	0.064	<0.01	<0.01	0.33	<0.05	<0.02
FTA	**MW112**	**06 Dec 2017**	**0089_MW112_S_171206**	**Normal**	**204243**	0.12	0.30	11	0.72	28	<0.02	0.13	0.43	1.5	0.47	*2.1*	0.040	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	0.054	<0.01	<0.01	0.36	<0.05	<0.02
FTA	**MW112**	**18 Jan 2018**	**0089_MW112_D_180118**	**Normal**	**205797**	0.31	0.77	17	2.1	22	<0.002	0.22	0.44	2.7	0.62	*2.3*	0.021	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.10	<0.001	<0.001	0.27	<0.005	<0.002
FTA	**MW112**	**18 Jan 2018**	**0089_MW112_S_180118**	**Normal**	**205797**	0.13	0.44	7.7	0.90	38	<0.002	0.21	0.48	2.0	0.72	*1.5*	0.039	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.064	<0.001	<0.001	0.57	<0.005	<0.002
FTA	**MW112**	**08 Jan 2020**	**0089_MW112_200108**	**Normal**	**EP2000179**	0.04	0.10	4.94	0.48	19.6	<0.02	<0.2	0.12	0.56	0.16	0.56	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.13	<0.05	<0.05	0.26	<0.05	<0.02
FTA	**MW112**	**30 Mar 2020**	**0089_MW112_200330**	**Normal**	**EP2003333**	0.17	0.34	16.3	1.70	54.7	<0.02	0.2	0.48	2.04	0.51	*2.58*	0.06	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.17	<0.05	<0.05	0.58	<0.05	<0.02
FTA	**MW112**	**30 Mar 2020**	**0089_QC102_200330**	**Field Duplicate**	**EP2003333**	0.19	0.35	16.7	1.69	54.3	<0.02	0.2	0.50	2.02	0.54	*2.56*	0.06	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.16	<0.05	<0.05	0.54	<0.05	<0.02
FTA	**MW112**	**30 Mar 2020**	**0089_QC202_200330**	**Interlab Duplicate**	**711144**	0.10	0.19	9.2	0.73	28	<0.01	0.13	0.28	0.98	0.38	*1.2*	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.12	<0.01	<0.01	0.27	<0.05	<0.05
FTA	**MW112**	**15 Jul 2020**	**0089_MW112_200715**	**Normal**	**EP2007385**	0.25	2.12	62.7	10.5	21.2	<0.02	0.2	0.75	4.48	0.63	*7.30*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.42	<0.05	<0.05	0.11	<0.05	<0.02
FTA	**MW112**	**21 Sep 2020**	**0089_MW112_200921**	**Normal**	**EP2010093**	0.17	0.95	33.7	5.38	17.5	<0.02	0.1	0.48	2.54	0.43	*4.30*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.13	<0.05	<0.05	0.23	<0.05	<0.02
FTA	**MW112**	**14 Dec 2020**	**0089_MW112_201214**	**Normal**	**EP2013984**	0.14	0.53	32.5	3.74	16.6	<0.02	0.2	0.41	2.86	0.54	*3.84*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.14	<0.05	<0.05	0.17	<0.05	<0.02
FTA	**MW112**	**16 Mar 2021**	**0089_MW112_210316**	**Normal**	**EP2102833**	0.17	1.52	36.6	5.00	14.4	<0.02	0.2	0.56	3.59	0.64	*4.28*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.15	<0.05	<0.05	0.14	<0.05	<0.02
FTA	**MW112**	**16 Mar 2021**	**0089_QC112_210316**	**Field Duplicate**	**EP2102833**	0.13	1.00	23.4	3.07	16.0	<0.02	0.1	0.43	2.43	0.49	*3.39*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.12	<0.05	<0.05	0.21	<0.05	<0.02
FTA	**MW112**	**16 Mar 2021**	**0089_QC212_210316**	**Interlab Duplicate**	**781350**	0.11	0.43	21	2.7	20	<0.01	0.17	0.37	2.1	0.44	*2.6*	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.09	<0.01	<0.01	0.21	<0.05	<0.05
FTA	**MW112**	**08 Jun 2021**	**0089_MW112_210608**	**Normal**	**EP2106448**	0.16	1.01	30.4	4.54	26.8	<0.02	0.2	0.56	2.95	0.53	*3.76*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.19	<0.05	<0.05	0.25	<0.05	<0.02
FTA	**MW112**	**30 Aug 2021**	**0089_MW112_210830**	**Normal**	**EP2110020**	0.08	0.31	7.60	1.14	31.7	<0.02	0.1	0.32	1.07	0.37	*0.94*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.05	<0.05	<0.05	0.47	<0.05	<0.02
FTA	**MW112**	**10 Jan 2022**	**0089_MW112_220110**	**Normal**	**EP2200214**	0.12	0.53	13.5	0.61	45.0	<0.02	0.2	0.38	2.52	0.92	*0.58*	0.07	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	0.67	<0.05	<0.02
FTA	**MW112**	**14 Mar 2022**	**0089_MW112_220314**	**Normal**	**EP2202975**	0.11	0.50	12.2	2.58	44.8	<0.02	0.1	0.29	1.68	0.59	*1.67*	0.08	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.12	<0.05	<0.05	0.49	<0.05	<0.02
FTA	**MW112**	**14 Mar 2022**	**0089_QC105_220314**	**Field Duplicate**	**EP2202975**	0.10	0.34	7.98	2.43	39.7	<0.02	0.1	0.29	1.63	0.57	*1.57*	0.07	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.15	<0.05	<0.05	0.47	<0.05	<0.02
FTA	**MW112**	**14 Mar 2022**	**0089_QC205_220314**	**Interlab Duplicate**	**872911**	0.09	0.23	9.7	1.2	50	<0.01	0.10	0.24	1.1	0.41	*1.3*	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.14	<0.01	<0.01	0.33	<0.05	<0.05
FTA	**MW112**	**07 Jun 2022**	**0089_MW112_220607**	**Normal**	**EP2206880**	0.02	0.13	7.64	1.52	73.6	<0.02	<0.1	0.12	0.59	0.23	*0.99*	0.08	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.10	<0.05	<0.05	0.71	<0.05	<0.02
FTA	**MW112**	**07 Jun 2022**	**0089_QC105_220607**	**Field Duplicate**	**EP2206880**	0.02	0.15	8.02	1.43	80.8	<0.02	<0.1	0.12	0.60	0.25	*1.00*	0.08	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.09	<0.05	<0.05	0.74	<0.05	<0.02
FTA	**MW112**	**07 Jun 2022**	**0089_QC205_220607**	**Interlab Duplicate**	**896805**	0.027	0.15	3.0	0.73	6.7	<0.004	0.045	0.098	0.68	0.19	*1.1*	0.071	0.006	<0.001	<0.001	<0.001	<0.001	<0.008	0.087	0.013	<0.004	0.46	<0.004	<0.004
FTA	**MW112**	**05 Sep 2022**	**0089_MW112_220905**	**Normal**	**EP2211343**	0.07	0.21	8.15	0.98	59.5	<0.02	<0.1	0.18	0.73	0.28	*1.40*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	0.69	<0.05	<0.02
FTA	**MW112**	**12 Dec 2022**	**0089_MW112_221212**	**Normal**	**EP2216902**	0.06	0.16	6.72	0.44	45.6	<0.02	0.1	0.24	0.84	0.22	*0.68*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	0.65	<0.05	<0.02
FTA	**MW112**	**13 Mar 2023**	**0089_MW112_230313**	**Normal**	**EP2303119**	0.06	0.16	5.94	2.62	15.8	<0.02	0.1	0.22	1.00	0.42	*1.72*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.13	<0.05	<0.05	0.38	<0.05	<0.02
FTA	**MW112**	**06 Jun 2023**	**0089_MW112_230606**	**Normal**	**EP2307463**	0.14	0.55	26.8	6.03	21.6	<0.02	0.1	0.43	2.83	0.56	*4.38*

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																									
FTA	**MW120**	**16 Nov 2017**	**0089_MW120_D_171116**	**Normal**	**203411**	0.031	0.060	5.9	0.19	1.5	<0.002	0.020	0.022	0.12	0.024	0.37	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW120**	**16 Nov 2017**	**0089_MW120_S_171116**	**Normal**	**203411**	0.028	0.046	5.9	0.16	1.3	<0.002	0.020	0.021	0.11	0.028	0.37	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW120**	**06 Dec 2017**	**0089_MW120_D_171206**	**Normal**	**204243**	0.033	0.072	6.8	0.26	1.4	<0.002	0.020	0.020	0.12	0.014	0.41	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW120**	**06 Dec 2017**	**0089_MW120_S_171206**	**Normal**	**204243**	0.032	0.073	6.1	0.23	1.5	<0.002	0.020	0.021	0.12	0.013	0.33	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW120**	**18 Jan 2018**	**0089_MW120_D_180118**	**Normal**	**205797**	0.020	0.14	3.5	0.34	2.3	<0.002	0.023	0.024	0.16	0.021	0.20	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW120**	**18 Jan 2018**	**0089_MW120_S_180118**	**Normal**	**205797**	0.026	0.14	3.6	0.40	2.5	<0.002	0.023	0.024	0.20	0.020	0.20	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW120**	**16 Dec 2019**	**0089_MW120_191216**	**Normal**	**EP1913380**	0.04	0.09	5.12	0.48	4.86	<0.02	<0.1	0.04	0.20	0.03	0.25	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**30 Mar 2020**	**0089_MW120_200330**	**Normal**	**EP2003333**	0.05	0.10	5.36	0.67	9.29	<0.02	<0.1	0.04	0.28	0.03	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**15 Jul 2020**	**0089_MW120_200715**	**Normal**	**EP2007385**	0.04	0.11	2.47	0.47	4.28	<0.02	<0.1	0.03	0.26	0.02	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**15 Jul 2020**	**0089_QC106_200715**	**Field Duplicate**	**EP2007385**	0.04	0.12	2.44	0.48	5.95	<0.02	<0.1	0.04	0.26	0.02	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**15 Jul 2020**	**0089_QC206_200215**	**Interlab Duplicate**	**732844**	0.03	0.10	1.8	0.29	4.8	<0.01	<0.05	0.03	0.18	0.02	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW120**	**14 Dec 2020**	**0089_MW120_201214**	**Normal**	**EP2013984**	0.02	0.05	1.66	0.27	3.86	<0.02	<0.1	0.03	0.15	<0.02	0.12	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**16 Mar 2021**	**0089_MW120_210316**	**Normal**	**EP2102833**	0.03	0.05	3.33	0.46	3.81	<0.02	<0.1	0.03	0.15	<0.02	0.20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**08 Jun 2021**	**0089_MW120_210608**	**Normal**	**EP2106448**	0.05	0.05	2.25	0.45	3.88	<0.02	<0.1	0.03	0.17	<0.02	0.13	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**30 Aug 2021**	**0089_MW120_210830**	**Normal**	**EP2110020**	0.02	0.08	16.8	2.23	0.23	<0.02	<0.1	<0.02	0.12	<0.02	*1.59*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**10 Jan 2022**	**0089_MW120_220110**	**Normal**	**EP2200214**	<0.02	0.05	12.7	4.29	1.05	<0.02	<0.1	<0.02	0.14	<0.02	*2.19*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**10 Jan 2022**	**0089_QC104_220110**	**Field Duplicate**	**EP2200214**	<0.02	0.06	13.6	3.75	1.04	<0.02	<0.1	<0.02	0.14	<0.02	*2.14*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**10 Jan 2022**	**0089_QC204_220110**	**Interlab Duplicate**	**854607**	0.02	0.04	8.1	2.5	0.99	<0.01	<0.05	0.02	0.08	0.01	*1.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW120**	**14 Mar 2022**	**0089_MW120_220314**	**Normal**	**EP2202975**	0.02	0.06	6.94	2.40	1.21	<0.02	<0.1	<0.02	0.13	<0.02	*1.59*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**14 Mar 2022**	**0089_QC104_220314**	**Field Duplicate**	**EP2202975**	0.02	0.06	8.05	2.57	1.32	<0.02	<0.1	<0.02	0.13	<0.02	*1.57*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**14 Mar 2022**	**0089_QC204_220314**	**Interlab Duplicate**	**872911**	0.02	0.04	3.2	0.63	3.3	<0.01	<0.05	0.02	0.10	0.01	0.37	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW120**	**07 Jun 2022**	**0089_MW120_220607**	**Normal**	**EP2206880**	0.02	0.05	3.52	0.74	1.64	<0.02	<0.1	<0.02	0.10	<0.02	0.42	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**05 Sep 2022**	**0089_MW120_220905**	**Normal**	**EP2211343**	0.03	0.07	22.2	3.67	0.36	<0.02	<0.1	<0.02	0.11	<0.02	*2.00*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**05 Sep 2022**	**0089_QC116_220905**	**Field Duplicate**	**EP2211343**	0.02	0.08	21.5	3.54	0.33	<0.02	<0.1	<0.02	0.12	<0.02	*2.00*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**05 Sep 2022**	**0089_QC216_220905**	**Interlab Duplicate**	**920981**	0.02	0.11	17	2.1	0.28	<0.01	<0.05	0.01	0.07	0.01	*1.4*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW120**	**12 Dec 2022**	**0089_MW120_221212**	**Normal**	**EP2216902**	0.02	0.06	15.0	2.95	0.68	<0.02	<0.1	<0.02	0.12	<0.02	*1.60*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**13 Mar 2023**	**0089_MW120_230313**	**Normal**	**EP2303119**	0.02	0.03	4.24	3.26	0.55	<0.02	<0.1	<0.02	0.10	<0.02	*1.47*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**13 Mar 2023**	**0089_QC105_230313**	**Field Duplicate**	**EP2303119**	<0.02	0.02	4.71	1.38	0.78	<0.02	<0.1	<0.02	0.10	<0.02	*0.69*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**13 Mar 2023**	**0089_QC205_230313**	**Interlab Duplicate**	**972487**	0.02	0.04	5.2	1.1	0.99	<0.01	<0.05	0.02	0.09	0.01	*0.98*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW120**	**06 Jun 2023**	**0089_MW120_230606**	**Normal**	**EP2307463**	0.02	0.05	1.98	0.31	3.09	<0.02	<0.1	0.04	0.16	<0.02	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**06 Jun 2023**	**0089_QC103_230606**	**Field Duplicate**	**EP2307463**	<0.02	0.05	2.33	0.45	2.29	<0.02	<0.1	0.02	0.13	<0.02	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**06 Jun 2023**	**0089_QC203_230606**	**Interlab Duplicate**	**997465**	0.02	0.06	2.2	0.25	2.2	<0.01	<0.05	0.03	0.13	0.01	0.22	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW120**	**05 Sep 2023**	**0089_MW120_230905**	**Normal**	**EP2312170**	0.02	0.04	1.60	0.28	1.26	<0.02	<0.1	<0.02	0.08	<0.02	0.12	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**05 Sep 2023**	**0089_QC115_230905**	**Field Duplicate**	**EP2312170**	<0.02	0.04	1.62	0.26	1.21	<0.02	<0.1	<0.02	0.08	<0.02	0.11	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW120**	**05 Sep 2023**	**0089_QC215_230905**	**Interlab Duplicate**	**1023399**	0.02	0.03	1.7	0.22	1.3	<0.01	<0.05	0.01	0.05	<0.01	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW121**	**23 Feb 2016**	**D53_MB03A**	**Normal**	**EP1601568**					9.22						0.36									<0.1	<0.1			
FTA	**MW121**	**25 Oct 2016**	**D53_MB03A**	**Normal**	**521581**					1.6						0.04									<0.05				
FTA	**MW121**	**08 Mar 2017**	**0089_MW121_S_170803**	**Normal**	**199045**	0.014	0.041	1.7	0.08	1.5	<0.002	0.051	0.17	0.21	0.1	0.13	0.002	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.043	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW121**	**20 Sep 2017**	**0089_MW121_D_170920**	**Normal**	**176250**	0.010	0.022	0.70	0.023	0.89	<0.002	0.030	0.062	0.13	0.038	0.051	0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.010	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW121**	**20 Sep 2017**	**0089_MW121_S_170920**	**Normal**	**176250**	0.01	0.021	0.63	0.024	0.84	<0.002	0.030	0.062	0.13	0.036	0.056	0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.010	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW121**	**18 Oct 2017**	**0089_MW121_D_171018**	**Normal**	**178113**	0.007	0.018	0.59	0.037	0.61	<0.002	0.026	0.066	0.13	0.040	0.053	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	0.011	<0.001	<0.005	<0.01	<0.02	<0.002
FTA	**MW121**	**18 Oct 2017**	**0089_MW121_S_171018**	**Normal**	**178113**	0.007	0.014	0.47	0.030	0.41	<0.002	0.024	0.061	0.13	0.041	0.054	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	0.008	<0.001	<0.005	<0.01	<0.02	<0.002
FTA	**MW121**	**16 Nov 2017**	**0089_MW121_D_171116**	**Normal**	**203411**	0.004	0.008	0.24	0.029	0.27	<0.002	0.01	0.034	0.083	0.021	0.040	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.002	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW121**	**16 Nov 2017**	**0089_MW121_S_171116**	**Normal**	**203411**	0.003	0.006	0.23	0.029	0.19	<0.002	0.01	0.030	0.080	0.019	0.041	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW121**	**06 Dec 2017**	**0089_MW121_D_171206**	**Normal**	**204243**	0.005	0.012	0.37	0.039	0.60	<0.002	0.01	0.031	0.068	0.016	0.038	0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.006	0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW121**	**06 Dec 2017**	**0089_MW121_S_171206**	**Normal**	**204243**	0.004	0.007	0.26	0.040	0.34	<0.002	0.01	0.023	0.060	0.012	0.029	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW121**	**18 Jan 2018**	**0089_MW121_D_180118**	**Normal**	**205797**	0.020	0.066	1.4	0.096	4.1	<0.002	0.056	0.13	0.22	0.079	0.12	0.006	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.040	0.004	<0.001	0.02	<0.005	<0.002
FTA	**MW121**	**18 Jan 2018**	**0089_MW121_S_180118**	**Normal**	**205797**	0.017	0.054	1.2	0.093	3.8	<0.002	0.050	0.11	0.19	0.072	0.11	0.006	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.033	0.004	<0.001	0.02	<0.005	<0.002
FTA	**MW121**	**16 Dec 2019**	**0089_MW121_191216**	**Normal**	**EP1913380**	0.04	0.06	1.72	0.18	4.39	<0.02	0.1	0.21	0.27	0.09	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.10	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW121**	**30 Mar 2020**	**0089_MW121_200330**	**Normal**	**EP2003333**	0.60	1.17	15.3	1.34	47.5	<0.02	0.1	0.48	2.37	0.24	*0.88*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.17	0.05	<0.05	0.42	<0.05	<0.02
FTA	**MW121**	**15 Jul 2020**	**0089_MW121_200715**	**Normal**	**EP2007385**	0.15	0.45	20.3	1.00	20.1	<0.02	0.1	0.42	1.21	0.26	*0.76*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.10	<0.05	<0.05	0.05	<0.05	<0.02
FTA	**MW121**	**21 Sep 2020**	**0089_MW121_200921**	**Normal**	**EP2010093**	0.04	0.07	3.05	0.15	4.04	<0.02	<0.1	0.08	0.28	0.04	0.14	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW121**	**14 Dec 2020**	**0089_MW121_201214**	**Normal**	**EP2013992**	0.04	0.07	3.25	0.13	4.87	<0.02	<0.1	0.08	0.30	0.05	0.15	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW121**	**16 Mar 2021**	**0089_MW121_210316**	**Normal**	**EP2102833**	0.64	1.53	17.7	2.35	29.3	<0.02	0.2	0.40	2.16	0.31	*1.18*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.14	<0.05	<0.05	0.32	<0.05	<0.02
FTA	**MW121**	**08 Jun 2021**	**0089_MW121_210608**	**Normal**	**EP2106448**	0.09	0.30	10.5	0.39	2.86	<0.02	0.1	0.26	0.99	0.16	0.28	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW121**	**30 Aug 2021**	**0089_MW121_210830**	**Normal**	**EP2110020**	0.19	0.48	11.4	1.03	76.5	<0.02	0.1	0.23	1.22	0.27	*1.42*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	0.43	<0.05	<0.02
FTA	**MW121**	**10 Jan 2022**	**0089_MW121_220110**	**Normal**	**EP2200214**	<0.02	<0.02	0.11	<0.02	0.22	<0.02	<0.1	<0.02	0.04	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW121**	**14 Mar 2022**	**0089_MW121_220314**	**Normal**	**EP2202975**	<0.02	<0.02	0.16	0.03	0.33	<0.02	<0.1	<0.02	0.04	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW121**	**14 Mar 2022**	**0089_QC102_220314**	**Field Duplicate**	**EP2202975**	<0.02	<0.02	0.16	0.03	0.43	<0.02	<0.1	<0.02	0.05	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW121**	**14 Mar 2022**	**0089_QC202_220314**	**Interlab Duplicate**	**872911**	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW121**	**07 Jun 2022**	**0089_MW121_220607**	**Normal**	**EP2206880**	0.05	0.16	5.30	0.22	0.59	<0.02	<0.1	0.13	0.46	0.08	0.20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW121**	**07 Jun 2022**	**0089_QC101_220607**	**Field Duplicate**	**EP2206880**	0.05	0.16	5.40	0.27	0.72	<0.02	<0.1	0.12	0.45	0.08	0.20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW121**	**07 Jun 2022**	**0089_QC201_220607**	**Interlab Duplicate**	**896805**	0.046	0.11	4.4	0.17	0.45	<0.004	0.047	0.087	0.41	0.070	0.16	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004
FTA	**MW121**	**05 Sep 2022**	**0089_MW121_220905**	**Normal**	**EP2211343**	<0.02	<0.02	0.10	<0.02	0.09	<0.02	<0.1	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW121**	**12 Dec 2022**	**0089_MW121_221212**	**Normal**	**EP2216902**	<0.02	<0.02	0.10	<0.02	0.06	<0.02	<0.1	0.02	0.04	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW121**	**13 Mar 2023**	**0089_MW121_230313**	**Normal**	**EP2303119**	0.02	<0.02	0.38	0.02	0.08	<0.02	<0.1	0.02	0.07	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW121**	**06 Jun 2023**	**0089_MW121_230606**	**Normal**	**EP2307463**	0.08	0.22	6.47	0.87	5.07	<0.02	0.2	0.32	0.76	0.17	*0.60*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW121**	**05 Sep 2023**	**0089_MW121_230905**	**Normal**	**EP2312170**	<0.02	<0.02	0.61	0.05	0.35	<0.02	<0.1	0.02	0.08	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**08 Mar 2017**	**0089_MW123_S_170803**	**Normal**	**199045**	0.038	0.029	0.16	0.003	0.37	<0.002	0.01	0.009	0.024	0.003	0.005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW123**	**20 Sep 2017**	**0089_MW123_D_170920**	**Normal**	**176250**	0.045	0.036	0.23	0.002	0.43	<0.002	0.02	0.01	0.038	0.005	0.005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW123**	**20 Sep 2017**	**0089_MW123_S_170920**	**Normal**	**176250**	0.046	0.036	0.20	0.002	0.45	<0.002	0.01	0.009	0.034	0.003	0.005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW123**	**18 Oct 2017**	**0089_MW123_D_171018**	**Normal**	**178113**	0.040	0.039	0.23	0.006	0.56	<0.002	0.01	0.01	0.043	0.005	0.007	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002
FTA	**MW123**	**18 Oct 2017**	**0089_MW123_S_171018**	**Normal**	**178113**	0.039	0.035	0.22	0.006	0.39	<0.002	0.01	0.01	0.043	0.005	0.006	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002
FTA	**MW123**	**16 Nov 2017**	**0089_MW123_D_171116**	**Normal**	**203411**	0.042	0.039	0.24	0.006	0.36	<0.002	0.020	0.020	0.060	0.006	0.007	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW123**	**16 Nov 2017**	**0089_MW123_S_171116**	**Normal**	**203411**	0.039	0.048	0.23	0.005	0.32	<0.002	0.01	0.020	0.040	0.005	0.005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW123**	**06 Dec 2017**	**0089_MW123_D_171206**	**Normal**	**204243**	0.038	0.043	0.28	0.010	0.31	<0.002	0.020	0.024	0.062	0.007	0.007	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
FTA	**MW123**	**10 Jan 2022**	**0089_QC101_220110**	**Field Duplicate**	**EP2200214**	0.14	0.08	0.30	<0.02	0.02	<0.02	<0.1	0.07	0.37	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**10 Jan 2022**	**0089_QC201_220110**	**Interlab Duplicate**	**854607**	0.09	0.08	0.18	<0.01	0.02	<0.01	<0.05	0.05	0.19	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.05	<0.05	<0.05
FTA	**MW123**	**14 Mar 2022**	**0089_MW123_220314**	**Normal**	**EP2202975**	0.31	0.22	0.70	<0.02	0.06	<0.02	0.1	0.17	0.84	0.04	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**07 Jun 2022**	**0089_MW123_220607**	**Normal**	**EP2206880**	0.20	0.18	0.57	<0.02	0.05	<0.02	<0.1	0.12	0.46	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**05 Sep 2022**	**0089_MW123_220905**	**Normal**	**EP2211343**	0.10	0.10	0.24	<0.02	0.04	<0.02	<0.1	0.04	0.19	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**05 Sep 2022**	**0089_QC114_220905**	**Field Duplicate**	**EP2211343**	0.13	0.13	0.41	<0.02	0.04	<0.02	<0.1	0.06	0.26	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**05 Sep 2022**	**0089_QC214_220905**	**Interlab Duplicate**	**920981**	0.07	0.06	0.19	<0.01	0.02	<0.01	<0.05	0.03	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW123**	**12 Dec 2022**	**0089_MW123_221212**	**Normal**	**EP2216902**	0.08	<0.02	0.06	<0.02	0.01	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**12 Dec 2022**	**0089_QC114_221212**	**Field Duplicate**	**EP2216902**	0.09	<0.02	0.06	<0.02	0.01	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**12 Dec 2022**	**0089_QC214_221212**	**Interlab Duplicate**	**950091**	0.08	<0.01	0.05	<0.01	0.01	<0.01	<0.05	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW123**	**13 Mar 2023**	**0089_MW123_230313**	**Normal**	**EP2303119**	0.31	0.28	2.24	<0.02	0.03	<0.02	<0.1	0.05	0.31	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**13 Mar 2023**	**0089_QC101_230313**	**Field Duplicate**	**EP2303119**	0.31	0.28	1.85	<0.02	0.03	<0.02	<0.1	0.05	0.26	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**13 Mar 2023**	**0089_QC201_230313**	**Interlab Duplicate**	**972487**	0.33	0.33	2.1	<0.01	0.03	<0.01	0.06	0.05	0.28	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW123**	**06 Jun 2023**	**0089_MW123_230606**	**Normal**	**EP2307463**	0.25	0.19	1.64	<0.02	0.02	<0.02	<0.1	0.04	0.22	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**06 Jun 2023**	**0089_QC101_230606**	**Field Duplicate**	**EP2307463**	0.34	0.30	2.35	<0.02	0.03	<0.02	<0.1	0.06	0.34	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**06 Jun 2023**	**0089_QC201_230606**	**Interlab Duplicate**	**997465**	0.24	0.26	1.9	<0.01	0.01	<0.01	<0.05	0.04	0.25	0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW123**	**05 Sep 2023**	**0089_MW123_230905**	**Normal**	**EP2312170**	0.09	0.06	0.47	<0.02	0.01	<0.02	<0.1	<0.02	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**05 Sep 2023**	**0089_QC114_230905**	**Field Duplicate**	**EP2312170**	0.08	0.06	0.47	<0.02	0.01	<0.02	<0.1	<0.02	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW123**	**05 Sep 2023**	**0089_QC214_230905**	**Interlab Duplicate**	**1023399**	0.09	0.05	0.57	<0.01	0.01	<0.01	<0.05	0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW124**	**08 Mar 2017**	**0089_MW124_S_170803**	**Normal**	**199045**	0.003	0.001	0.006	<0.001	0.018	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW124**	**20 Sep 2017**	**0089_MW124_D_170920**	**Normal**	**176250**	0.005	0.002	0.003	<0.001	0.008	<0.002	0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW124**	**20 Sep 2017**	**0089_MW124_S_170920**	**Normal**	**176250**	0.005	0.002	0.006	<0.001	0.007	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW124**	**18 Oct 2017**	**0089_MW124_D_171018**	**Normal**	**178113**	<0.001	0.001	0.004	<0.001	0.012	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002
FTA	**MW124**	**18 Oct 2017**	**0089_MW124_S_171018**	**Normal**	**178113**	0.002	<0.001	0.003	<0.001	0.017	<0.002	0.002	<0.002	<0.001	<0.001	0.004	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002
FTA	**MW124**	**16 Nov 2017**	**0089_MW124_D_171116**	**Normal**	**203411**	0.004	0.003	0.003	<0.001	0.003	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW124**	**16 Nov 2017**	**0089_MW124_S_171116**	**Normal**	**203411**	0.004	0.002	0.002	<0.001	0.008	<0.002	0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW124**	**06 Dec 2017**	**0089_MW124_D_171206**	**Normal**	**204243**	0.004	0.002	0.004	<0.001	0.005	<0.002	0.003	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW124**	**06 Dec 2017**	**0089_MW124_S_171206**	**Normal**	**204243**	0.003	0.001	0.005	<0.001	0.005	<0.002	0.003	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW124**	**18 Jan 2018**	**0089_MW124_D_180118**	**Normal**	**205797**	0.002	0.001	0.004	<0.001	0.005	<0.002	0.007	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW124**	**18 Jan 2018**	**0089_MW124_S_180118**	**Normal**	**205797**	0.003	0.001	0.006	<0.001	0.010	<0.002	0.020	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW124**	**09 Jan 2020**	**0089_MW124_200109**	**Normal**	**EP2000249**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**09 Jan 2020**	**0089_QC101_200109**	**Field Duplicate**	**EP2000249**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**09 Jan 2020**	**0089_QC201_200109**	**Interlab Duplicate**	**696324**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW124**	**30 Mar 2020**	**0089_MW124_200330**	**Normal**	**EP2003333**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**15 Jul 2020**	**0089_MW124_200715**	**Normal**	**EP2007382**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**22 Sep 2020**	**0089_MW124_200922**	**Normal**	**EP2010151**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**14 Dec 2020**	**0089_MW124_201214**	**Normal**	**EP2013984**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**15 Mar 2021**	**0089_MW124_210315**	**Normal**	**EP2102752**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**08 Jun 2021**	**0089_MW124_210608**	**Normal**	**EP2106448**	0.12	0.26	1.57	0.03	0.17	<0.02	<0.1	0.07	0.42	0.03	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**30 Aug 2021**	**0089_MW124_210830**	**Normal**	**EP2110019**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**10 Jan 2022**	**0089_MW124_220110**	**Normal**	**EP2200216**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**14 Mar 2022**	**0089_MW124_220314**	**Normal**	**EP2202976**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**07 Jun 2022**	**0089_MW124_220607**	**Normal**	**EP2206880**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**05 Sep 2022**	**0089_MW124_220905**	**Normal**	**EP2211345**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**05 Sep 2022**	**0089_QC102_220905**	**Field Duplicate**	**EP2211345**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**05 Sep 2022**	**0089_QC202_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW124**	**12 Dec 2022**	**0089_MW124_221212**	**Normal**	**EP2216878**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**13 Mar 2023**	**0089_MW124_230313**	**Normal**	**EP2303085**	0.03	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**07 Jun 2023**	**0089_MW124_230607**	**Normal**	**EP2307500**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW124**	**05 Sep 2023**	**0089_MW124_230905**	**Normal**	**EP2312183**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW125**	**08 Mar 2017**	**0089_MW125_S_170803**	**Normal**	**199045**	0.049	0.074	0.24	<0.001	0.011	<0.002	0.008	0.006	0.041	0.002	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW125**	**20 Sep 2017**	**0089_MW125_D_170920**	**Normal**	**176250**	0.087	0.12	0.32	<0.001	0.005	<0.002	0.01	<0.002	0.050	0.002	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW125**	**20 Sep 2017**	**0089_MW125_S_170920**	**Normal**	**176250**	0.077	0.11	0.30	<0.001	0.011	<0.002	0.01	<0.002	0.046	0.002	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW125**	**18 Oct 2017**	**0089_MW125_D_171018**	**Normal**	**178113**	0.042	0.058	0.21	<0.001	0.011	<0.002	0.007	0.005	0.032	0.001	<0.001	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002
FTA	**MW125**	**18 Oct 2017**	**0089_MW125_S_171018**	**Normal**	**178113**	0.033	0.046	0.16	<0.001	0.011	<0.002	0.006	0.004	0.023	0.001	<0.001	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002
FTA	**MW125**	**18 Oct 2017**	**0089_QC1MW_171018**	**Field Duplicate**	**178113**	0.048	0.067	0.20	<0.001	0.006	<0.002	0.008	0.005	0.033	0.001	0.003	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002
FTA	**MW125**	**18 Oct 2017**	**0089_QC2MW_171018**	**Interlab Duplicate**	**568770**	0.04	0.05	0.27	<0.01	<0.01	<0.01	<0.05	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW125**	**16 Nov 2017**	**0089_MW125_D_171116**	**Normal**	**203411**	0.096	0.12	0.32	<0.001	0.001	<0.002	0.01	0.008	0.067	0.003	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW125**	**16 Nov 2017**	**0089_MW125_S_171116**	**Normal**	**203411**	0.089	0.11	0.34	<0.001	0.003	<0.002	0.01	0.008	0.063	0.003	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW125**	**06 Dec 2017**	**0089_MW125_D_171206**	**Normal**	**204243**	0.062	0.089	0.20	<0.001	0.006	<0.002	0.008	0.006	0.040	0.002	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW125**	**06 Dec 2017**	**0089_MW125_S_171206**	**Normal**	**204243**	0.050	0.071	0.20	<0.001	0.007	<0.002	0.008	0.006	0.038	0.002	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW125**	**18 Jan 2018**	**0089_MW125_D_180118**	**Normal**	**205797**	0.052	0.080	0.28	<0.001	0.013	<0.002	0.01	0.007	0.053	0.002	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW125**	**18 Jan 2018**	**0089_MW125_S_180118**	**Normal**	**205797**	0.040	0.063	0.26	<0.001	0.007	<0.002	0.01	0.007	0.046	0.003	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW125**	**18 Jan 2018**	**0089_QC1MW_180118**	**Field Duplicate**	**205797**	0.043	0.062	0.27	<0.001	0.008	<0.002	0.01	0.006	0.040	0.003	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW125**	**18 Jan 2018**	**0089_QC2MW_180118**	**Interlab Duplicate**	**581139**	0.03	0.05	0.15	<0.01	<0.01	<0.01	<0.05	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW125**	**18 Jan 2018**	**0089_QC2MW_180118**	**Interlab Duplicate**	**581139**	0.03	0.05	0.14	<0.01	<0.01	<0.01	<0.05	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW125**	**09 Jan 2020**	**0089_MW125_200109**	**Normal**	**EP2000249**	0.10	0.15	0.66	<0.02	<0.01	<0.02	<0.1	<0.02	0.12	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW125**	**30 Mar 2020**	**0089_MW125_200330**	**Normal**	**EP2003333**	0.08	0.07	0.40	<0.02	0.04	<0.02	<0.1	<0.02	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW125**	**15 Jul 2020**	**0089_MW125_200715**	**Normal**	**EP2007382**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW125**	**22 Sep 2020**	**0089_MW125_200922**	**Normal**	**EP2010151**	0.05	0.06	0.21	<0.02	0.04	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW125**	**14 Dec 2020**	**0089_MW125_201214**	**Normal**	**EP2013984**	0.09	0.08	0.38	<0.02	<0.01	<0.02	<0.1	<0.02	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW125**	**15 Mar 2021**	**0089_MW125_210315**	**Normal**	**EP2102752**	0.14	0.12	0.43	<0.02	<0.01	<0.02	<0.1	0.02	0.11	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW125**	**08 Jun 2021**	**0089_MW125_210608**	**Normal**	**EP2106448**	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW125**	**30 Aug 2021**	**0089_MW125_210830**	**Normal**	**EP2110019**	0.06	0.07	0.26	<0.02	0.02	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW125**	**30 Aug 2021**	**0089_QC101_210830**	**Field Duplicate**	**EP2110019**	0.06	0.07	0.26	<0.02	0.02	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																									
FTA	**MW126**	**18 Oct 2017**	**0089_MW126_S_171018**	**Normal**	**178113**	0.002	0.002	0.012	<0.001	0.019	<0.002	0.003	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	0.002	<0.001	<0.005	<0.01	<0.02	<0.002
FTA	**MW126**	**16 Nov 2017**	**0089_MW126_D_171116**	**Normal**	**203411**	<0.001	<0.001	0.002	<0.001	0.009	<0.002	<0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW126**	**16 Nov 2017**	**0089_MW126_S_171116**	**Normal**	**203411**	<0.001	<0.001	0.003	<0.001	0.006	<0.002	<0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW126**	**06 Dec 2017**	**0089_MW126_D_171206**	**Normal**	**204243**	<0.001	<0.001	0.004	<0.001	0.006	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW126**	**06 Dec 2017**	**0089_MW126_S_171206**	**Normal**	**204243**	0.001	<0.001	0.006	<0.001	0.005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW126**	**18 Jan 2018**	**0089_MW126_D_180118**	**Normal**	**205797**	<0.001	<0.001	0.004	<0.001	0.004	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW126**	**18 Jan 2018**	**0089_MW126_S_180118**	**Normal**	**205797**	<0.001	<0.001	0.007	<0.001	0.006	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW126**	**08 Jan 2020**	**0089_MW126_200108**	**Normal**	**EP2000179**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**31 Mar 2020**	**0089_MW126_200331**	**Normal**	**EP2003364**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**15 Jul 2020**	**0089_MW126_200715**	**Normal**	**EP2007382**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**22 Sep 2020**	**0089_MW126_200922**	**Normal**	**EP2010151**	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**14 Dec 2020**	**0089_MW126_201214**	**Normal**	**EP2013984**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**15 Mar 2021**	**0089_MW126_210315**	**Normal**	**EP2102752**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**08 Jun 2021**	**0089_MW126_210608**	**Normal**	**EP2106448**	0.11	0.10	0.30	<0.02	0.02	<0.02	<0.1	0.02	0.10	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**30 Aug 2021**	**0089_MW126_210830**	**Normal**	**EP2110019**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**10 Jan 2022**	**0089_MW126_220110**	**Normal**	**EP2200211**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**14 Mar 2022**	**0089_MW126_220314**	**Normal**	**EP2202976**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**07 Jun 2022**	**0089_MW126_220607**	**Normal**	**EP2206880**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**05 Sep 2022**	**0089_MW126_220905**	**Normal**	**EP2211345**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**12 Dec 2022**	**0089_MW126_221212**	**Normal**	**EP2216878**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**13 Mar 2023**	**0089_MW126_230313**	**Normal**	**EP2303085**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**13 Mar 2023**	**0089_QC110_230313**	**Field Duplicate**	**EP2303085**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**13 Mar 2023**	**0089_QC210_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW126**	**07 Jun 2023**	**0089_MW126_230607**	**Normal**	**EP2307500**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW126**	**05 Sep 2023**	**0089_MW126_230905**	**Normal**	**EP2312183**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**08 Mar 2017**	**0089_MW127_S_170803**	**Normal**	**199045**	<0.001	<0.001	0.004	<0.001	0.007	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW127**	**08 Mar 2017**	**0089_QC1MW_S_170803**	**Field Duplicate**	**199045**	<0.001	<0.001	0.004	<0.001	0.005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW127**	**04 Aug 2017**	**0089_QC2MW_170803**	**Interlab Duplicate**	**557474**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW127**	**20 Sep 2017**	**0089_MW127_D_170920**	**Normal**	**176250**	<0.001	<0.001	0.002	<0.001	0.004	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW127**	**20 Sep 2017**	**0089_MW127_S_170920**	**Normal**	**176250**	<0.001	<0.001	0.003	<0.001	0.004	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW127**	**18 Oct 2017**	**0089_MW127_D_171018**	**Normal**	**178113**	0.001	<0.001	0.01	<0.001	0.005	<0.002	<0.002	<0.002	<0.001	<0.001	0.002	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002
FTA	**MW127**	**18 Oct 2017**	**0089_MW127_S_171018**	**Normal**	**178113**	0.001	<0.001	0.004	<0.001	0.006	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	<0.001	<0.001	<0.001	<0.01	<0.02	<0.002
FTA	**MW127**	**16 Nov 2017**	**0089_MW127_D_171116**	**Normal**	**203411**	<0.001	<0.001	0.002	<0.001	0.003	<0.002	<0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW127**	**16 Nov 2017**	**0089_MW127_S_171116**	**Normal**	**203411**	<0.001	<0.001	0.003	<0.001	0.004	<0.002	<0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW127**	**16 Nov 2017**	**0089_QC1MW_171116**	**Field Duplicate**	**203411**	<0.001	<0.001	0.002	<0.001	0.004	<0.002	<0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW127**	**16 Nov 2017**	**0089_QC2MW_171116**	**Interlab Duplicate**	**573296**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW127**	**06 Dec 2017**	**0089_MW127_D_171206**	**Normal**	**204243**	<0.001	<0.001	0.002	<0.001	0.003	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW127**	**06 Dec 2017**	**0089_MW127_S_171206**	**Normal**	**204243**	0.002	<0.002	0.003	<0.001	0.003	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW127**	**18 Jan 2018**	**0089_MW127_D_180118**	**Normal**	**205797**	<0.001	<0.001	0.002	<0.001	0.004	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW127**	**18 Jan 2018**	**0089_MW127_S_180118**	**Normal**	**205797**	<0.001	<0.001	0.003	<0.001	0.007	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW127**	**08 Jan 2020**	**0089_MW127_200108**	**Normal**	**EP2000179**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**31 Mar 2020**	**0089_MW127_200331**	**Normal**	**EP2003364**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**31 Mar 2020**	**0089_QC104_200331**	**Field Duplicate**	**EP2003364**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**31 Mar 2020**	**0089_QC204_200331**	**Interlab Duplicate**	**711434**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW127**	**15 Jul 2020**	**0089_MW127_200715**	**Normal**	**EP2007382**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**22 Sep 2020**	**0089_MW127_200922**	**Normal**	**EP2010151**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**14 Dec 2020**	**0089_MW127_201214**	**Normal**	**EP2013984**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**15 Mar 2021**	**0089_MW127_210315**	**Normal**	**EP2102752**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**08 Jun 2021**	**0089_MW127_210608**	**Normal**	**EP2106448**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**30 Aug 2021**	**0089_MW127_210830**	**Normal**	**EP2110019**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**10 Jan 2022**	**0089_MW127_220110**	**Normal**	**EP2200211**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**14 Mar 2022**	**0089_MW127_220314**	**Normal**	**EP2202976**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**07 Jun 2022**	**0089_MW127_220607**	**Normal**	**EP2206880**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**05 Sep 2022**	**0089_MW127_220905**	**Normal**	**EP2211345**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**05 Sep 2022**	**0089_QC113_220905**	**Field Duplicate**	**EP2211345**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**05 Sep 2022**	**0089_QC213_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW127**	**12 Dec 2022**	**0089_MW127_221212**	**Normal**	**EP2216878**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**12 Dec 2022**	**0089_QC113_221212**	**Field Duplicate**	**EP2216878**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**12 Dec 2022**	**0089_QC213_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW127**	**13 Mar 2023**	**0089_MW127_230313**	**Normal**	**EP2303085**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**07 Jun 2023**	**0089_MW127_230607**	**Normal**	**EP2307500**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW127**	**05 Sep 2023**	**0089_MW127_230905**	**Normal**	**EP2312183**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW128**	**08 Mar 2017**	**0089_MW128_S_170803**	**Normal**	**199045**	0.005	0.011	0.82	0.11	1.8	<0.002	0.006	0.005	0.027	0.006	0.14	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW128**	**20 Sep 2017**	**0089_MW128_D_170920**	**Normal**	**176250**	0.001	0.001	0.12	0.063	4.0	<0.002	0.004	<0.002	0.013	0.003	0.048	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW128**	**20 Sep 2017**	**0089_MW128_S_170920**	**Normal**	**176250**	<0.001	0.002	0.099	0.077	5.0	<0.002	0.005	<0.002	0.013	0.002	0.052	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW128**	**20 Sep 2017**	**0089_QC1MW_170920**	**Field Duplicate**	**176250**	0.001	0.002	0.12	0.071	4.5	<0.002	0.005	0.002	0.013	0.003	0.052	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW128**	**20 Sep 2017**	**0089_QC2MW_170920**	**Interlab Duplicate**	**564343**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW128**	**18 Oct 2017**	**0089_MW128_D_171018**	**Normal**	**178113**	0.001	0.002	0.093	0.080	4.2	<0.002	0.003	0.004	0.011	0.002	0.034	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002
FTA	**MW128**	**18 Oct 2017**	**0089_MW128_S_171018**	**Normal**	**178113**	0.001	0.002	0.10	0.084	4.7	<0.002	0.003	0.004	0.011	0.002	0.037	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002
FTA	**MW128**	**16 Nov 2017**	**0089_MW128_D_171116**	**Normal**	**203411**	0.002	0.003	0.080	0.11	4.0	<0.002	<0.004	0.004	0.009	0.002	0.032	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW128**	**16 Nov 2017**	**0089_MW128_S_171116**	**Normal**	**203411**	0.002	0.003	0.092	0.11	4.1	<0.002	<0.004	0.004	0.009	0.002	0.032	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
FTA	**MW128**	**06 Dec 2017**	**0089_MW128_D_171206**	**Normal**	**204243**	0.002	0.005	0.090	0.099	3.2	<0.002	0.003	0.004	0.010	0.002	0.031	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW128**	**06 Dec 2017**	**0089_MW128_S_171206**	**Normal**	**204243**	0.002	0.003	0.092	0.091	3.5	<0.002	0.003	0.004	0.010	0.003	0.034	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW128**	**06 Dec 2017**	**0089_QC1MW_171206**	**Field Duplicate**	**204243**	0.002	0.003	0.088	0.099	3.4	<0.002	0.003	0.004	0.010	0.003	0.033	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
FTA	**MW128**	**06 Dec 2017**	**0089_QC2MW_171206**	**Interlab Duplicate**	**576599**	<0.01	<0.01	0.13	0.14	6.2	<0.01	<0.05	<0.01	0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																									
Demolition Ground	**MW139**	**20 Nov 2017**	**0089_MW139_D_171120**	**Normal**	**203545**	<0.001	<0.001	0.002	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
Demolition Ground	**MW139**	**20 Nov 2017**	**0089_MW139_S_171120**	**Normal**	**203545**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
Demolition Ground	**MW139**	**04 Dec 2017**	**0089_MW139_D_171204**	**Normal**	**204124**	<0.001	<0.001	0.002	<0.001	0.004	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002
Demolition Ground	**MW139**	**04 Dec 2017**	**0089_MW139_S_171204**	**Normal**	**204124**	<0.001	<0.001	0.002	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002
Demolition Ground	**MW139**	**17 Jan 2018**	**0089_MW139_D_1801117**	**Normal**	**205691**	<0.001	<0.001	0.008	<0.001	0.003	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW139**	**17 Jan 2018**	**0089_MW139_S_1801117**	**Normal**	**205691**	<0.001	<0.001	0.009	<0.001	0.004	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW139**	**01 Feb 2018**	**0089_MW139_D_180201**	**Normal**	**206292**	<0.001	<0.001	0.005	<0.001	0.005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW139**	**01 Feb 2018**	**0089_MW139_I_180201**	**Normal**	**206292**	<0.001	<0.001	0.004	<0.001	0.004	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW139**	**01 Feb 2018**	**0089_MW139_S_180201**	**Normal**	**206292**	<0.001	<0.001	0.006	<0.001	0.003	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW139**	**01 Feb 2018**	**0089_QC6MW_180201**	**Field Duplicate**	**206292**	<0.001	<0.001	0.005	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW139**	**01 Feb 2018**	**0089_QC7MW_180201**	**Interlab Duplicate**	**582979**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Demolition Ground	**MW139**	**08 Jan 2020**	**0089_MW139_200108**	**Normal**	**EP2000179**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**08 Jan 2020**	**0089_QC101_200108**	**Field Duplicate**	**EP2000179**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**08 Jan 2020**	**0089_QC201_200108**	**Interlab Duplicate**	**696100**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05
Demolition Ground	**MW139**	**30 Mar 2020**	**0089_MW139_200330**	**Normal**	**EP2003308**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**20 Jul 2020**	**0089_MW139_200720**	**Normal**	**EP2007544**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**22 Sep 2020**	**0089_MW139_200922**	**Normal**	**EP2010151**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**14 Dec 2020**	**0089_MW139_201214**	**Normal**	**EP2013983**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**16 Mar 2021**	**0089_MW139_210316**	**Normal**	**EP2102837**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**08 Jun 2021**	**0089_MW139_210608**	**Normal**	**EP2106464**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**08 Jun 2021**	**0089_QC101_210608**	**Field Duplicate**	**EP2106464**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**08 Jun 2021**	**0089_QC201_210608**	**Interlab Duplicate**	**802464**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Demolition Ground	**MW139**	**31 Aug 2021**	**0089_MW139_210831**	**Normal**	**EP2110071**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**10 Jan 2022**	**0089_MW139_220110**	**Normal**	**EP2200214**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**15 Mar 2022**	**0089_MW139_220315**	**Normal**	**EP2203018**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**08 Jun 2022**	**0089_MW139_220608**	**Normal**	**EP2206969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**05 Sep 2022**	**0089_MW139_220905**	**Normal**	**EP2211343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**14 Nov 2022**	**0089_MW139_221114**	**Normal**	**EP2215357**																								
Demolition Ground	**MW139**	**12 Dec 2022**	**0089_MW139_221212**	**Normal**	**EP2216902**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**15 Mar 2023**	**0089_MW139_230315**	**Normal**	**EP2303226**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**07 Jun 2023**	**0089_MW139_230607**	**Normal**	**EP2307497**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**07 Jun 2023**	**0089_QC110_230607**	**Field Duplicate**	**EP2307497**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW139**	**07 Jun 2023**	**0089_QC210_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Demolition Ground	**MW139**	**11 Sep 2023**	**0089_MW139_230911**	**Normal**	**EP2312528**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW141**	**30 Oct 2010**	**C24-MBO3**	**Normal**	**EP1005976**					12.6						*1.32*													
Demolition Ground	**MW141**	**18 Oct 2013**	**WA0006_C24_MB03**	**Normal**	**EP1307981**					62.5						*3.08*								<0.1					
Demolition Ground	**MW141**	**26 May 2015**	**C24_MB03**	**Normal**	**EP1510572**					5.62						*0.66*								<0.5	<0.5				
Demolition Ground	**MW141**	**29 Sep 2015**	**C24_MB03**	**Normal**	**EP1514335**					31.9						*2.16*								<0.5	<0.5				
Demolition Ground	**MW141**	**25 Oct 2016**	**C24_MB03**	**Normal**	**521581**					31						*0.66*								<0.05					
Demolition Ground	**MW141**	**01 Aug 2017**	**0089_MW141_S_170801**	**Normal**	**198918**	0.74	2.5	24	0.94	58	<0.002	0.53	2.9	27	0.81	*2.3*	0.015	0.006	<0.002	<0.005	<0.01	<0.05	<0.001	0.059	0.004	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW141**	**19 Sep 2017**	**0089_MW141_D_170919**	**Normal**	**176140**	2.4	5.4	38	2.1	50	<0.002	0.86	1.8	32	0.64	*2.8*	0.030	0.005	<0.002	<0.005	<0.01	<0.05	<0.001	0.10	0.004	<0.001	0.01	<0.005	<0.002
Demolition Ground	**MW141**	**19 Sep 2017**	**0089_MW141_S_170919**	**Normal**	**176140**	2.4	5.4	39	2.1	60	<0.002	0.87	1.8	36	0.63	*2.7*	0.024	0.005	<0.002	<0.005	<0.01	<0.05	<0.001	0.10	0.002	<0.001	0.01	<0.005	<0.002
Demolition Ground	**MW141**	**19 Sep 2017**	**0089_QC1MW_170919**	**Field Duplicate**	**176140**	2.2	5.4	37	2.2	61	<0.002	0.83	1.6	33	0.61	*2.9*	0.027	0.006	<0.002	<0.005	<0.01	<0.05	<0.001	0.10	0.004	<0.001	0.01	<0.005	<0.002
Demolition Ground	**MW141**	**19 Sep 2017**	**0089_QC2MW_170919**	**Interlab Duplicate**	**564343**	1.3	3.1	34	1.5	72	<0.01	0.59	2.7	24	0.83	*2.4*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Demolition Ground	**MW141**	**17 Oct 2017**	**0089_MW141_D_171017**	**Normal**	**177985**	1.5	2.1	20	1.1	37	<0.02	0.45	2.2	18	0.53	*1.4*	0.014	<0.02	<0.02	<0.05	<0.1	<0.5	<0.010	0.031	<0.01	<0.01	<0.1	<0.05	<0.02
Demolition Ground	**MW141**	**17 Oct 2017**	**0089_MW141_S_171017**	**Normal**	**177985**	2.0	3.4	34	1.4	87	<0.02	0.62	4.3	32	0.86	*2.6*	0.020	<0.02	<0.02	<0.05	<0.1	<0.5	<0.010	0.12	<0.01	<0.01	<0.1	<0.05	<0.02
Demolition Ground	**MW141**	**20 Nov 2017**	**0089_MW141_D_171120**	**Normal**	**203545**	1.5	3.3	42	1.8	68	<0.1	0.79	4.1	37	1.2	*4.2*	<0.05	<0.1	<0.1	<0.2	<0.5	<2.5	<0.05	0.26	<0.05	<0.05	<0.5	<0.2	<0.1
Demolition Ground	**MW141**	**20 Nov 2017**	**0089_MW141_S_171120**	**Normal**	**203545**	1.8	3.8	47	1.9	69	<0.1	0.89	5.1	43	1.4	*4.4*	<0.05	<0.1	<0.1	<0.2	<0.5	<2.5	<0.05	0.19	<0.05	<0.05	<0.5	<0.2	<0.1
Demolition Ground	**MW141**	**04 Dec 2017**	**0089_MW141_D_171204**	**Normal**	**204124**	1.3	2.4	21	0.92	35	<0.04	0.58	1.4	19	0.51	*1.6*	<0.02	<0.04	<0.04	<0.1	<0.2	<1	<0.02	0.060	<0.02	<0.020	<0.2	<0.1	<0.04
Demolition Ground	**MW141**	**04 Dec 2017**	**0089_MW141_S_171204**	**Normal**	**204124**	1.6	4.2	33	1.3	44	<0.04	0.86	2.7	31	0.77	*2.9*	0.020	<0.04	<0.04	<0.1	<0.2	<1	<0.02	0.17	<0.02	<0.02	<0.2	<0.1	<0.04
Demolition Ground	**MW141**	**17 Jan 2018**	**0089_MW141_D_1801117**	**Normal**	**205691**	1.7	2.0	26	1.3	28	<0.002	0.82	2.2	27	1.0	*2.6*	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.080	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW141**	**17 Jan 2018**	**0089_MW141_S_1801117**	**Normal**	**205691**	2.5	4.2	54	2.7	93	<0.002	1.6	5.0	65	1.9	*6.2*	0.070	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.24	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW141**	**01 Feb 2018**	**0089_MW141_D_180201**	**Normal**	**206292**	1.2	3.7	44	2.6	61	<0.02	0.84	2.4	31	0.86	*3.2*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	0.20	<0.01	<0.01	<0.1	<0.05	<0.02
Demolition Ground	**MW141**	**01 Feb 2018**	**0089_MW141_I_180201**	**Normal**	**206292**	1.2	3.6	43	2.8	63	<0.02	0.86	2.4	30	0.94	*3.3*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	0.19	<0.01	<0.01	<0.1	<0.05	<0.02
Demolition Ground	**MW141**	**01 Feb 2018**	**0089_MW141_S_180201**	**Normal**	**206292**	1.5	4.8	56	3.8	85	<0.02	1.1	3.4	45	1.3	*4.1*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	0.29	<0.01	<0.01	<0.1	<0.05	<0.02
Demolition Ground	**MW141**	**08 Jan 2020**	**0089_MW141_200108**	**Normal**	**EP2000179**	1.25	1.46	19.4	0.72	52.1	<0.02	<0.2	1.36	15.1	0.36	*1.02*	0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.12	<0.05	<0.05	0.02	<0.05	<0.02
Demolition Ground	**MW141**	**30 Mar 2020**	**0089_MW141_200330**	**Normal**	**EP2003308**	0.54	0.95	14.3	1.18	50.0	<0.02	0.2	0.87	8.49	0.31	*1.19*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW141**	**20 Jul 2020**	**0089_MW141_200720**	**Normal**	**EP2007544**	0.48	1.52	16.7	1.28	45.7	<0.02	0.2	1.29	13.1	0.44	*1.71*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.06	<0.05	<0.05	0.02	<0.05	<0.02
Demolition Ground	**MW141**	**23 Sep 2020**	**0089_MW141_200923**	**Normal**	**EP2010220**	0.70	1.50	18.2	1.88	59.9	<0.02	0.3	1.32	13.6	0.40	*1.71*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.02
Demolition Ground	**MW141**	**14 Dec 2020**	**0089_MW141_201214**	**Normal**	**EP2013975**	0.59	1.06	10.3	1.01	39.8	<0.02	0.2	1.04	9.09	0.31	*1.10*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW141**	**16 Mar 2021**	**0089_MW141_210316**	**Normal**	**EP2102837**	0.43	0.79	8.10	1.06	31.0	<0.02	0.2	0.69	5.86	0.23	*0.78*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW141**	**08 Jun 2021**	**0089_MW141_210608**	**Normal**	**EP2106464**	0.38	0.76	10.8	0.79	34.9	<0.02	0.2	0.75	7.77	0.23	*0.91*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW141**	**31 Aug 2021**	**0089_MW141_210831**	**Normal**	**EP2110071**	0.63	2.45	26.2	2.44	89.9	<0.02	0.4	1.64	16.1	0.58	*2.47*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW141**	**10 Jan 2022**	**0089_MW141_220110**	**Normal**	**EP2200214**	1.18	4.12	53.7	2.68	147	<0.02	0.4	2.12	27.0	0.93	*3.97*	0.06	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.11	<0.05	<0.05	0.03	<0.05	<0.02
Demolition Ground	**MW141**	**10 Jan 2022**	**0089_QC112_220110**	**Field Duplicate**	**EP2200214**	1.24	2.91	50.0	2.51	127	<0.02	0.5	2.18	27.2	0.92	*3.91*	0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.10	<0.05	<0.05	0.03	<0.05	<0.02
Demolition Ground	**MW141**	**10 Jan 2022**	**0089_QC212_220110**	**Interlab Duplicate**	**854607**	0.77	2.9	57	2.8	130	<0.01	0.40	1.9	26	0.76	*4.0*	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.08	<0.01	<0.01	<0.05	<0.05	<0.05
Demolition Ground	**MW141**	**15 Mar 2022**	**0089_MW141_220315**	**Normal**	**EP2203018**	0.97	2.15	30.8	2.10	81.2	<0.02	0.4	1.58	19.0	0.81	*3.17*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW141**	**08 Jun 2022**	**0089_MW141_220608**	**Normal**	**EP2206969**	0.49	1.07	13.3	1.62	40.3	<0.02	0.2	0.67	5.54	0.28	*1.34*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW141**	**05 Sep 2022**	**0089_MW141_220905**	**Normal**	**EP2211343**	0.58	1.94	29.2	2.35	102	<0.02	0.3	1.30	13.4	0.54	*2.86*	0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW141**	**05 Sep 2022**	**0089_QC101_220905**	**Field Duplicate**	**EP2211343**	0.52	1.75	27.3	2.08	102	<0.02	0.3	1.29	13.0	0.50	*2.68*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW141**	**05 Sep 2022**	**0089_QC201_220905**	**Interlab Duplicate**	**920981**	0.49	0.96	22	1.2	60	<0.01	0.23	1.1	4.6	0.36	*1.8*	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Demolition Ground	**MW141**	**12 Dec 2022**	**0089_MW141_221212**	**Normal**	**EP2216902**	0.33	0.94	15.0	1.42	129	<0.02	0.2	0.76	5.86	0.30	*0.99*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW141**	**12 Dec 2022**	**0089_QC101_221212**	**Field Duplicate**	**EP2216902**	0.38	1.05	17.5	1.54	140	<0.02	0.2	0.79	6.04	0.33	*1.07*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW141**	**12 Dec 2022**	**0089_QC201_221212**	**Interlab Duplicate**	**950091**	0.45	0.60	13	0.78	91	<0.01	0.22	0.58	6.4	0.31	*1.2*	0.04	<0.25	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Demolition Ground	**MW141**	**15 Mar 2023**	**0089_MW141_230315**	**Normal**	**EP2303226**	0.47	0.91	19.1	1.32	72.5	<0.02	0.3	1.20	12.2	0.34	*1.43*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.02
Demolition Ground	**MW141**	**07 Jun 2023**	**0089_MW141_230607**	**Normal**	**EP2307497**	0.37	0.86	12.7	1.10	53.0	<0.02	0.2	0.80	7.32	0.26	*1.17*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW141**	**11 Sep 2023**	**0089_MW141_230911**	**Normal**	**EP2312528**	0.21	0.49	7.10	0.89	33.2	<0.02	0.1	0.28	3.05	0.14	*0.65*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**01 Aug 2017**	**0089_MW142_S_170801**	**Normal**	**198918**	0.010	0.

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
Demolition Ground	**MW142**	**17 Jan 2018**	**0089_MW142_D_1801117**	**Normal**	**205691**	0.020	0.056	0.80	0.024	1.1	<0.002	0.020	0.047	0.48	0.017	0.043	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW142**	**17 Jan 2018**	**0089_MW142_S_1801117**	**Normal**	**205691**	0.033	0.079	1.1	0.024	1.1	<0.002	0.023	0.066	0.74	0.024	0.053	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW142**	**01 Feb 2018**	**0089_MW142_D_180201**	**Normal**	**206292**	0.022	0.042	0.66	0.020	1.1	<0.002	0.020	0.046	0.45	0.020	0.044	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW142**	**01 Feb 2018**	**0089_MW142_I_180201**	**Normal**	**206292**	0.039	0.082	1.5	0.022	1.2	<0.002	0.030	0.098	1.1	0.036	0.087	0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW142**	**01 Feb 2018**	**0089_MW142_S_180201**	**Normal**	**206292**	0.11	0.24	4.6	0.037	1.8	<0.002	0.086	0.33	3.9	0.080	0.21	0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW142**	**08 Jan 2020**	**0089_MW142_200108**	**Normal**	**EP2000179**	0.46	1.27	17.0	0.55	7.34	<0.02	<0.2	1.72	15.1	0.35	*0.92*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**30 Mar 2020**	**0089_MW142_200330**	**Normal**	**EP2003308**	0.57	1.33	38.2	0.65	3.59	<0.02	0.4	2.00	21.1	0.63	*3.04*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**20 Jul 2020**	**0089_MW142_200720**	**Normal**	**EP2007544**	<0.02	0.04	1.87	0.08	1.23	<0.02	<0.1	0.04	0.47	0.03	0.21	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**23 Sep 2020**	**0089_MW142_200923**	**Normal**	**EP2010220**	0.03	0.08	3.22	0.13	2.36	<0.02	<0.1	0.08	1.04	0.04	0.25	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**14 Dec 2020**	**0089_MW142_201214**	**Normal**	**EP2013975**	0.05	0.11	3.21	0.11	2.40	<0.02	<0.1	0.11	1.27	0.04	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**16 Mar 2021**	**0089_MW142_210316**	**Normal**	**EP2102837**	0.06	0.13	3.70	0.11	3.13	<0.02	<0.1	0.15	1.49	0.04	0.22	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**08 Jun 2021**	**0089_MW142_210608**	**Normal**	**EP2106464**	0.09	0.21	4.21	0.12	2.50	<0.02	<0.1	0.21	2.02	0.06	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**30 Aug 2021**	**0089_MW142_210830**	**Normal**	**EP2110016**	0.06	0.16	3.24	0.11	2.42	<0.02	<0.1	0.15	1.35	0.04	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**10 Jan 2022**	**0089_MW142_220110**	**Normal**	**EP2200214**	0.06	0.10	2.67	0.09	3.33	<0.02	<0.1	0.06	0.91	<0.02	0.14	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**15 Mar 2022**	**0089_MW142_220315**	**Normal**	**EP2203018**	0.04	0.07	1.93	0.08	2.59	<0.02	<0.1	0.12	1.26	0.03	0.18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**08 Jun 2022**	**0089_MW142_220608**	**Normal**	**EP2206969**	0.03	0.07	1.55	0.05	2.32	<0.02	<0.1	0.08	0.67	<0.02	0.11	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**05 Sep 2022**	**0089_MW142_220905**	**Normal**	**EP2211343**	0.11	0.25	6.64	0.13	2.77	<0.02	0.1	0.29	2.55	0.07	0.41	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**12 Dec 2022**	**0089_MW142_221212**	**Normal**	**EP2216902**	0.12	0.25	4.86	0.15	2.86	<0.02	<0.1	0.33	2.95	0.10	0.33	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**15 Mar 2023**	**0089_MW142_230315**	**Normal**	**EP2303226**	0.14	0.26	4.45	0.14	3.07	<0.02	<0.1	0.32	3.31	0.08	0.29	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**07 Jun 2023**	**0089_MW142_230607**	**Normal**	**EP2307497**	0.20	0.37	5.12	0.05	0.86	<0.02	0.1	0.42	4.27	0.11	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW142**	**11 Sep 2023**	**0089_MW142_230911**	**Normal**	**EP2312528**	0.17	0.32	4.19	0.14	3.27	<0.02	<0.1	0.28	3.07	0.08	0.33	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW147**	**30 Oct 2010**	**C24-MB02**	**Normal**	**EP1005976**					<0.02						<0.02													
Demolition Ground	**MW147**	**18 Oct 2013**	**QC37**	**Field Duplicate**	**EP1307981**					<0.02						<0.02								<0.1					
Demolition Ground	**MW147**	**18 Oct 2013**	**WA0006_C24_MB02**	**Normal**	**EP1307981**					<0.02						<0.02								<0.1					
Demolition Ground	**MW147**	**26 May 2015**	**C24_MB02**	**Normal**	**EP1510572**					<0.1						0.13								<0.5	<0.5				
Demolition Ground	**MW147**	**29 Sep 2015**	**C24_MB02**	**Normal**	**EP1514335**					<0.1						<0.1								<0.5	<0.5				
Demolition Ground	**MW147**	**25 Oct 2016**	**C24_MB02**	**Normal**	**521581**					0.04						<0.01								<0.05					
Demolition Ground	**MW147**	**01 Aug 2017**	**0089_MW147_S_170801**	**Normal**	**198918**	0.005	0.013	0.21	<0.001	0.023	<0.002	0.003	<0.002	0.053	0.001	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW147**	**19 Sep 2017**	**0089_MW147_D_170919**	**Normal**	**176140**	0.003	0.004	0.093	<0.001	0.006	<0.002	0.003	<0.002	0.022	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW147**	**19 Sep 2017**	**0089_MW147_S_170919**	**Normal**	**176140**	0.003	0.005	0.10	<0.001	0.007	<0.002	0.003	<0.002	0.023	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW147**	**17 Oct 2017**	**0089_MW147_D_171017**	**Normal**	**177985**	0.003	0.007	0.13	<0.001	0.009	<0.002	<0.002	<0.002	0.018	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.03	<0.002
Demolition Ground	**MW147**	**17 Oct 2017**	**0089_MW147_S_171017**	**Normal**	**177985**	0.003	0.008	0.16	<0.001	0.012	<0.002	<0.002	<0.002	0.019	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.03	<0.002
Demolition Ground	**MW147**	**20 Nov 2017**	**0089_MW147_D_171120**	**Normal**	**203545**	0.003	0.005	0.14	<0.001	0.018	<0.002	<0.002	<0.002	0.018	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
Demolition Ground	**MW147**	**20 Nov 2017**	**0089_MW147_S_171120**	**Normal**	**203545**	0.003	0.012	0.20	<0.001	0.008	<0.002	<0.002	<0.002	0.017	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
Demolition Ground	**MW147**	**04 Dec 2017**	**0089_MW147_D_171204**	**Normal**	**204124**	0.002	0.004	0.070	<0.001	0.011	<0.002	<0.002	<0.002	0.016	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002
Demolition Ground	**MW147**	**04 Dec 2017**	**0089_MW147_S_171204**	**Normal**	**204124**	0.002	0.006	0.13	<0.001	0.010	<0.002	<0.002	<0.002	0.012	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002
Demolition Ground	**MW147**	**17 Jan 2018**	**0089_MW147_D_1801117**	**Normal**	**205691**	0.005	0.011	0.21	<0.001	0.003	<0.002	0.003	<0.002	0.019	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW147**	**17 Jan 2018**	**0089_MW147_S_1801117**	**Normal**	**205691**	0.009	0.027	0.40	<0.001	0.010	<0.002	0.003	<0.002	0.022	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW147**	**01 Feb 2018**	**0089_MW147_D_180201**	**Normal**	**206292**	0.006	0.012	0.24	<0.001	0.005	<0.002	0.003	<0.002	0.019	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW147**	**01 Feb 2018**	**0089_MW147_I_180201**	**Normal**	**206292**	0.005	0.013	0.19	<0.001	0.006	<0.002	0.003	<0.002	0.018	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW147**	**01 Feb 2018**	**0089_MW147_S_180201**	**Normal**	**206292**	0.007	0.020	0.34	<0.001	0.009	<0.002	0.003	<0.002	0.016	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW147**	**20 Jul 2020**	**0089_MW147_200720**	**Normal**	**EP2007544**	<0.02	<0.02	0.19	<0.02	0.05	<0.02	<0.1	<0.02	0.14	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW147**	**15 Mar 2023**	**0089_MW147_230315**	**Normal**	**EP2303226**	<0.02	<0.02	0.08	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW147**	**07 Jun 2023**	**0089_MW147_230607**	**Normal**	**EP2307497**	<0.02	<0.02	0.34	<0.02	0.02	<0.02	<0.1	<0.02	0.09	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW147**	**11 Sep 2023**	**0089_MW147_230911**	**Normal**	**EP2312528**	<0.02	<0.02	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**01 Aug 2017**	**0089_MW149_S_170801**	**Normal**	**198918**	<0.001	0.001	0.006	<0.001	0.006	<0.002	<0.002	<0.002	0.002	0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW149**	**19 Sep 2017**	**0089_MW149_D_170919**	**Normal**	**176140**	<0.001	<0.001	0.004	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW149**	**19 Sep 2017**	**0089_MW149_S_170919**	**Normal**	**176140**	<0.001	<0.001	<0.001	<0.001	0.007	<0.002	<0.002	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW149**	**17 Oct 2017**	**0089_MW149_D_171017**	**Normal**	**177985**	<0.001	<0.001	0.003	<0.001	0.005	<0.002	0.003	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.03	<0.002
Demolition Ground	**MW149**	**17 Oct 2017**	**0089_MW149_S_171017**	**Normal**	**177985**	0.001	<0.001	0.004	<0.001	0.007	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.03	<0.002
Demolition Ground	**MW149**	**20 Nov 2017**	**0089_MW149_D_171120**	**Normal**	**203545**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
Demolition Ground	**MW149**	**20 Nov 2017**	**0089_MW149_S_171120**	**Normal**	**203545**	<0.001	<0.001	0.004	<0.001	0.003	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
Demolition Ground	**MW149**	**04 Dec 2017**	**0089_MW149_D_171204**	**Normal**	**204124**	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002
Demolition Ground	**MW149**	**04 Dec 2017**	**0089_MW149_S_171204**	**Normal**	**204124**	<0.001	<0.001	0.002	<0.001	0.003	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002
Demolition Ground	**MW149**	**17 Jan 2018**	**0089_MW149_D_1801117**	**Normal**	**205691**	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW149**	**17 Jan 2018**	**0089_MW149_S_1801117**	**Normal**	**205691**	0.002	<0.001	0.001	<0.001	0.007	<0.002	0.007	<0.002	0.003	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW149**	**17 Jan 2018**	**0089_QC1MW_S_1801117**	**Field Duplicate**	**205691**	0.002	<0.001	0.001	<0.001	0.007	<0.002	0.005	<0.002	0.003	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW149**	**17 Jan 2018**	**0089_QC2MW_180117**	**Interlab Duplicate**	**580891**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Demolition Ground	**MW149**	**17 Jan 2018**	**0089_QC2MW_180117**	**Interlab Duplicate**	**580891**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Demolition Ground	**MW149**	**01 Feb 2018**	**0089_MW149_D_180201**	**Normal**	**206292**	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW149**	**01 Feb 2018**	**0089_MW149_I_180201**	**Normal**	**206292**	<0.001	<0.001	0.001	<0.001	0.003	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW149**	**01 Feb 2018**	**0089_MW149_S_180201**	**Normal**	**206292**	<0.001	<0.001	0.007	<0.001	0.007	<0.002	0.007	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Demolition Ground	**MW149**	**08 Jan 2020**	**0089_MW149_200108**	**Normal**	**EP2000179**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**30 Mar 2020**	**0089_MW149_200330**	**Normal**	**EP2003308**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**20 Jul 2020**	**0089_MW149_200720**	**Normal**	**EP2007544**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**23 Sep 2020**	**0089_MW149_200923**	**Normal**	**EP2010217**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**14 Dec 2020**	**0089_MW149_201214**	**Normal**	**EP2013983**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**16 Mar 2021**	**0089_MW149_210316**	**Normal**	**EP2102836**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**08 Jun 2021**	**0089_MW149_210608**	**Normal**	**EP2106464**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**08 Jun 2021**	**0089_QC105_210608**	**Field Duplicate**	**EP2106464**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**08 Jun 2021**	**0089_QC205_210608**	**Interlab Duplicate**	**802464**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Demolition Ground	**MW149**	**30 Aug 2021**	**0089_MW149_210830**	**Normal**	**EP2110016**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**10 Jan 2022**	**0089_MW149_220110**	**Normal**	**EP2200214**	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**15 Mar 2022**	**0089_MW149_220315**	**Normal**	**EP2203018**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**08 Jun 2022**	**0089_MW149_220608**	**Normal**	**EP2206969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**05 Sep 2022**	**0089_MW149_220905**	**Normal**	**EP2211343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Demolition Ground	**MW149**	**12 Dec 2022**	**0089_MW149_221212**	**Normal**	**EP2216902**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
WWTP	**MW158**	**07 Jun 2022**	**0089_MW158_220607**	**Normal**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW158**	**05 Sep 2022**	**0089_MW158_220905**	**Normal**	**EP2211340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW158**	**12 Dec 2022**	**0089_MW158_221212**	**Normal**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW158**	**13 Mar 2023**	**0089_MW158_230313**	**Normal**	**EP2303084**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW158**	**06 Jun 2023**	**0089_MW158_230606**	**Normal**	**EP2307463**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW158**	**04 Sep 2023**	**0089_MW158_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**07 Aug 2017**	**0089_MW161_S_170807**	**Normal**	**199149**	0.022	0.019	0.28	0.027	6.1	<0.002	0.048	0.033	0.099	0.06	0.035	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.015	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW161**	**18 Sep 2017**	**0089_MW161_S_170918**	**Normal**	**176030**	0.029	0.021	0.40	0.014	5.6	<0.002	0.063	0.092	0.098	0.072	0.030	0.010	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.011	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW161**	**19 Oct 2017**	**0089_MW161_S_171019**	**Normal**	**178275**	0.11	0.084	0.70	0.064	8.7	<0.002	0.10	0.20	0.26	0.11	0.054	0.0099	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.015	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW161**	**15 Nov 2017**	**0089_MW161_S_171115**	**Normal**	**203378**	0.049	0.040	0.71	0.12	8.6	<0.002	0.092	0.20	0.34	0.17	0.091	0.021	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.024	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW161**	**07 Dec 2017**	**0089_MW161_S_171207**	**Normal**	**204323**	0.066	0.042	0.48	0.040	7.0	<0.002	0.12	0.18	0.29	0.13	0.064	0.020	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.018	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW161**	**16 Jan 2018**	**0089_MW161_S_180116**	**Normal**	**205631**	0.076	0.063	0.64	0.063	7.2	<0.002	0.20	0.34	0.33	0.12	0.073	0.023	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.017	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW161**	**08 Jan 2020**	**0089_MW161_200108**	**Normal**	**EP2000182**	0.04	0.04	0.71	0.14	16.1	<0.02	0.1	0.45	0.37	0.10	0.10	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**01 Apr 2020**	**0089_MW161_200401**	**Normal**	**EP2003417**	0.09	0.12	1.73	0.31	11.5	<0.02	<0.1	0.32	0.36	0.11	0.20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**21 Jul 2020**	**0089_MW161_200721**	**Normal**	**EP2007594**	0.07	0.11	2.53	0.42	10.5	<0.02	0.1	0.36	0.36	0.11	0.23	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**21 Sep 2020**	**0089_MW161_200921**	**Normal**	**EP2010093**	0.06	0.05	1.70	0.22	10.6	<0.02	<0.1	0.32	0.27	0.09	0.17	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**14 Dec 2020**	**0089_MW161_201214**	**Normal**	**EP2013992**	0.03	0.04	1.15	0.14	7.06	<0.02	<0.1	0.17	0.17	0.08	0.11	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**15 Mar 2021**	**0089_MW161_210315**	**Normal**	**EP2102752**	0.05	0.05	0.81	0.11	7.16	<0.02	<0.1	0.21	0.17	0.06	0.08	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**10 Jun 2021**	**0089_MW161_210610**	**Normal**	**EP2106588**	0.05	0.06	0.76	0.10	6.04	<0.02	<0.1	0.27	0.21	0.08	0.09	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**30 Aug 2021**	**0089_MW161_210830**	**Normal**	**EP2110020**	0.04	0.02	0.50	0.08	5.09	<0.02	<0.1	0.20	0.16	0.08	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**10 Jan 2022**	**0089_MW161_220110**	**Normal**	**EP2200216**	0.08	0.08	0.89	0.14	5.45	<0.02	<0.1	0.14	0.34	0.11	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**15 Mar 2022**	**0089_MW161_220315**	**Normal**	**EP2203018**	0.03	0.02	0.35	0.07	4.08	<0.02	<0.1	0.20	0.20	0.10	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**07 Jun 2022**	**0089_MW161_220607**	**Normal**	**EP2206883**	0.05	0.06	0.84	0.11	4.21	<0.02	<0.1	0.15	0.23	0.09	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**05 Sep 2022**	**0089_MW161_220905**	**Normal**	**EP2211340**	<0.02	<0.02	0.23	0.03	3.02	<0.02	<0.1	0.08	0.08	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**12 Dec 2022**	**0089_MW161_221212**	**Normal**	**EP2216876**	<0.02	<0.02	0.10	0.03	4.55	<0.02	<0.1	0.11	0.09	0.04	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**13 Mar 2023**	**0089_MW161_230313**	**Normal**	**EP2303084**	<0.02	<0.02	0.18	0.03	2.85	<0.02	<0.1	0.04	0.04	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**06 Jun 2023**	**0089_MW161_230606**	**Normal**	**EP2307463**	<0.02	<0.02	0.08	<0.02	2.38	<0.02	<0.1	0.06	0.05	0.03	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**04 Sep 2023**	**0089_MW161_230904**	**Normal**	**EP2312225**	<0.02	0.02	0.26	0.03	2.63	<0.02	<0.1	0.06	0.09	0.04	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**04 Sep 2023**	**0089_QC104_230904**	**Field Duplicate**	**EP2312225**	<0.02	<0.02	0.25	0.03	2.71	<0.02	<0.1	0.06	0.10	0.04	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW161**	**04 Sep 2023**	**0089_QC204_230904**	**Interlab Duplicate**	**1023399**	0.01	0.02	0.26	0.03	2.5	<0.01	<0.05	0.07	0.08	0.04	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW166**	**07 Aug 2017**	**0089_MW166_S_170807**	**Normal**	**199149**	0.037	0.025	0.32	0.056	2	<0.002	0.072	0.073	0.13	0.054	0.067	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.021	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW166**	**18 Sep 2017**	**0089_MW166_S_170918**	**Normal**	**176030**	0.049	0.020	0.44	0.058	2.1	<0.002	0.085	0.16	0.17	0.097	0.074	0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.013	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW166**	**19 Oct 2017**	**0089_MW166_S_171019**	**Normal**	**178275**	0.052	0.037	0.32	0.075	1.9	<0.002	0.074	0.17	0.17	0.076	0.087	0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.016	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW166**	**15 Nov 2017**	**0089_MW166_S_171115**	**Normal**	**203378**	0.053	0.043	0.41	0.087	1.7	<0.002	0.082	0.20	0.19	0.084	0.070	0.004	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.012	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW166**	**07 Dec 2017**	**0089_MW166_S_171207**	**Normal**	**204323**	0.047	0.030	0.37	0.069	1.8	<0.002	0.092	0.17	0.21	0.090	0.064	0.003	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.011	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW166**	**16 Jan 2018**	**0089_MW166_S_180116**	**Normal**	**205631**	0.052	0.031	0.54	0.089	2.0	<0.002	0.094	0.18	0.23	0.077	0.056	0.003	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.007	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW166**	**08 Jan 2020**	**0089_MW166_200108**	**Normal**	**EP2000182**	0.05	0.04	0.72	0.08	8.95	<0.02	0.1	0.26	0.25	0.09	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**01 Apr 2020**	**0089_MW166_200401**	**Normal**	**EP2003417**	0.08	0.06	1.13	0.32	14.8	<0.02	<0.1	0.30	0.27	0.13	0.12	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**21 Jul 2020**	**0089_MW166_200721**	**Normal**	**EP2007594**	0.07	0.08	1.89	0.49	14.1	<0.02	<0.1	0.29	0.35	0.12	0.16	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**22 Sep 2020**	**0089_MW166_200922**	**Normal**	**EP2010151**	0.04	0.04	0.97	0.19	8.39	<0.02	<0.1	0.31	0.28	0.12	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**14 Dec 2020**	**0089_MW166_201214**	**Normal**	**EP2013984**	0.02	0.02	0.47	0.05	7.53	<0.02	<0.1	0.22	0.20	0.12	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**15 Mar 2021**	**0089_MW166_210315**	**Normal**	**EP2102752**	0.03	0.03	0.74	0.15	8.40	<0.02	<0.1	0.26	0.24	0.12	0.08	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**10 Jun 2021**	**0089_MW166_210610**	**Normal**	**EP2106588**	0.04	0.10	2.27	0.49	8.51	<0.02	0.1	0.34	0.37	0.17	0.16	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**30 Aug 2021**	**0089_MW166_210830**	**Normal**	**EP2110019**	0.03	0.04	0.95	0.22	8.16	<0.02	<0.1	0.29	0.26	0.14	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**10 Jan 2022**	**0089_MW166_220110**	**Normal**	**EP2200211**	<0.02	0.04	0.97	0.16	7.06	<0.02	<0.1	0.29	0.37	0.16	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**15 Mar 2022**	**0089_MW166_220315**	**Normal**	**EP2203018**	0.04	0.06	1.02	0.22	6.79	<0.02	0.1	0.38	0.50	0.20	0.12	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**07 Jun 2022**	**0089_MW166_220607**	**Normal**	**EP2206883**	0.02	0.03	0.77	0.20	7.90	<0.02	0.1	0.33	0.30	0.17	0.10	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**05 Sep 2022**	**0089_MW166_220905**	**Normal**	**EP2211340**	<0.02	0.02	0.52	0.08	6.18	<0.02	<0.1	0.24	0.23	0.12	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**12 Dec 2022**	**0089_MW166_221212**	**Normal**	**EP2216876**	0.06	0.07	1.16	0.18	7.80	<0.02	0.1	0.39	0.35	0.15	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**13 Mar 2023**	**0089_MW166_230313**	**Normal**	**EP2303084**	0.04	0.03	0.86	0.17	3.85	<0.02	0.1	0.25	0.23	0.13	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**06 Jun 2023**	**0089_MW166_230606**	**Normal**	**EP2307463**	0.05	0.04	0.69	0.11	4.09	<0.02	<0.1	0.25	0.24	0.15	0.07	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW166**	**04 Sep 2023**	**0089_MW166_230904**	**Normal**	**EP2312225**	0.06	0.03	0.63	0.14	3.91	<0.02	<0.1	0.24	0.25	0.14	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**07 Aug 2017**	**0089_MW171_S_170807**	**Normal**	**199149**	1.6	0.87	4.3	0.43	0.17	<0.002	0.7	0.44	2	0.11	0.23	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.008	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW171**	**18 Sep 2017**	**0089_MW171_S_170918**	**Normal**	**176030**	1.7	1.2	4.1	0.22	0.23	<0.002	0.72	0.23	1.7	0.16	0.25	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.006	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW171**	**19 Oct 2017**	**0089_MW171_S_171019**	**Normal**	**178275**	1.5	0.89	3.8	0.21	0.17	<0.002	0.64	0.48	2.0	0.095	0.22	0.002	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW171**	**15 Nov 2017**	**0089_MW171_S_171115**	**Normal**	**203378**	1.5	0.82	5.1	0.36	0.18	<0.002	0.63	0.40	2.1	0.16	0.24	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.005	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW171**	**07 Dec 2017**	**0089_MW171_S_171207**	**Normal**	**204323**	2.1	1.4	3.7	0.23	0.29	<0.002	0.68	0.53	2.6	0.14	0.26	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.007	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW171**	**16 Jan 2018**	**0089_MW171_S_180116**	**Normal**	**205631**	1.7	0.69	4.6	0.40	0.19	<0.002	0.88	0.60	2.5	0.20	0.22	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.004	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW171**	**01 Apr 2020**	**0089_MW171_200401**	**Normal**	**EP2003417**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**21 Jul 2020**	**0089_MW171_200721**	**Normal**	**EP2007594**	0.03	<0.02	0.10	<0.02	0.45	<0.02	<0.1	0.06	0.06	0.04	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**14 Dec 2020**	**0089_MW171_201214**	**Normal**	**EP2013992**	0.04	<0.02	0.06	<0.02	0.02	<0.02	<0.1	0.04	0.04	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**15 Mar 2021**	**0089_MW171_210315**	**Normal**	**EP2102752**	0.07	0.03	0.15	<0.02	0.03	<0.02	<0.1	0.04	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**10 Jun 2021**	**0089_MW171_210610**	**Normal**	**EP2106588**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**30 Aug 2021**	**0089_MW171_210830**	**Normal**	**EP2110019**	0.14	0.08	0.35	<0.02	<0.01	<0.02	<0.1	0.06	0.19	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**10 Jan 2022**	**0089_MW171_220110**	**Normal**	**EP2200216**	0.10	0.04	0.18	<0.02	<0.01	<0.02	<0.1	0.02	0.12	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**15 Mar 2022**	**0089_MW171_220315**	**Normal**	**EP2203018**	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**07 Jun 2022**	**0089_MW171_220607**	**Normal**	**EP2206883**	0.09	0.06	0.24	<0.02	0.03	<0.02	<0.1	0.05	0.14	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**05 Sep 2022**	**0089_MW171_220905**	**Normal**	**EP2211340**	0.03	<0.02	0.08	<0.02	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**12 Dec 2022**	**0089_MW171_221212**	**Normal**	**EP2216876**	0.12	0.07	0.32	<0.02	0.02	<0.02	<0.1	0.09	0.20	0.05	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**13 Mar 2023**	**0089_MW171_230313**	**Normal**	**EP2303084**	0.10	0.04	0.20	<0.02	0.02	<0.02	<0.1	0.04	0.12	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**13 Mar 2023**	**0089_QC103_230313**	**Field Duplicate**	**EP2303084**	0.03	<0.02	0.07	<0.02	<0.01	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**13 Mar 2023**	**0089_QC203_230313**	**Interlab Duplicate**	**972487**	0.02	<0.01	0.05	<0.01	<0.01	<0.01	<0.05	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW171**	**06 Jun 2023**	**0089_MW171_230606**	**Normal**	**EP2307463**	1.17	0.67	5.05	0.65	1.07	<0.02	0.6	0.50	1.85	0.15	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW171**	**04 Sep 2023**	**0089_MW171_230904**	**Normal**	**EP2312225**	1.00	0.59	4.93	0.87	0.87	<0.02	0.5	0.43	1.55	0.13	0.25	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW172**	**07 Aug 2017**	**0089_MW172_S_170807**	**Normal**	**199149**	<0.001	<0.001	0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
WWTP	**MW173**	**10 Jun 2021**	**0089_MW173_210610**	**Normal**	**EP2106579**	0.29	0.31	6.64	1.21	6.41	<0.02	0.1	0.32	0.80	0.25	*1.10*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.23	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW173**	**15 Mar 2022**	**0089_MW173_220315**	**Normal**	**EP2203018**	0.35	0.28	4.21	0.51	5.42	<0.02	<0.1	0.18	0.88	0.15	0.45	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW173**	**08 Jun 2022**	**0089_MW173_220608**	**Normal**	**EP2206969**	0.20	0.18	4.53	0.80	8.62	<0.02	<0.1	0.19	0.50	0.09	0.54	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW173**	**05 Sep 2022**	**0089_MW173_220905**	**Normal**	**EP2211340**	0.21	0.18	3.74	0.59	5.46	<0.02	<0.1	0.14	0.50	0.08	0.35	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW173**	**12 Dec 2022**	**0089_MW173_221212**	**Normal**	**EP2216876**	0.22	0.14	3.30	0.50	6.34	<0.02	<0.1	0.16	0.43	0.07	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW173**	**13 Mar 2023**	**0089_MW173_230313**	**Normal**	**EP2303084**	0.19	0.09	2.24	0.40	4.20	<0.02	<0.1	0.09	0.31	0.04	0.23	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW173**	**06 Jun 2023**	**0089_MW173_230606**	**Normal**	**EP2307415**	0.14	0.09	1.93	0.36	3.99	<0.02	<0.1	0.08	0.29	0.04	0.22	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW173**	**04 Sep 2023**	**0089_MW173_230904**	**Normal**	**EP2312225**	0.12	0.08	1.67	0.33	2.60	<0.02	<0.1	0.06	0.23	0.04	0.15	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**08 Aug 2017**	**0089_MW193_S_170808**	**Normal**	**199212**	1.5	1.4	8.8	0.33	3	<0.002	0.33	0.42	3.1	0.26	0.53	0.004	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.015	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW193**	**18 Sep 2017**	**0089_MW193_S_170918**	**Normal**	**176030**	1.4	1.7	7.1	0.57	1.8	<0.002	0.34	0.19	2.3	0.28	0.37	0.003	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.015	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW193**	**19 Oct 2017**	**0089_MW193_S_171019**	**Normal**	**178275**	1.1	1.2	6.2	0.36	2.3	<0.002	0.22	0.43	2.4	0.19	0.51	0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.004	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW193**	**15 Nov 2017**	**0089_MW193_S_171115**	**Normal**	**203378**	1.1	1.0	6.1	0.28	1.5	<0.002	0.20	0.36	2.5	0.23	0.36	0.002	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.012	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW193**	**07 Dec 2017**	**0089_MW193_S_171207**	**Normal**	**204323**	1.2	1.4	6.4	0.26	2.0	<0.002	0.26	0.40	3.2	0.28	0.43	0.003	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.016	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW193**	**16 Jan 2018**	**0089_MW193_S_180116**	**Normal**	**205631**	1.1	0.83	5.7	0.28	1.1	<0.002	0.31	0.37	2.4	0.23	0.30	0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.006	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW193**	**08 Jan 2020**	**0089_MW193_200108**	**Normal**	**EP2000186**	0.84	0.82	8.20	0.35	1.01	<0.02	0.3	0.41	1.95	0.16	0.33	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.14	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**31 Mar 2020**	**0089_MW193_200331**	**Normal**	**EP2003374**	1.36	1.28	18.1	0.90	3.62	<0.02	0.4	0.62	2.64	0.31	*0.81*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**15 Jul 2020**	**0089_MW193_200715**	**Normal**	**EP2007385**	1.08	1.31	10.6	0.71	2.67	<0.02	0.2	0.48	2.50	0.26	*0.66*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**16 Dec 2020**	**0089_MW193_201216**	**Normal**	**EP2014087**	0.76	0.58	6.87	0.28	1.56	<0.02	0.2	0.27	1.43	0.12	0.33	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**16 Mar 2021**	**0089_MW193_210316**	**Normal**	**EP2102833**	1.22	1.29	10.0	0.70	2.08	<0.02	0.3	0.52	2.44	0.24	*0.62*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**10 Jun 2021**	**0089_MW193_210610**	**Normal**	**EP2106580**	0.89	1.06	8.21	0.45	1.90	<0.02	0.2	0.36	2.01	0.17	0.49	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**30 Aug 2021**	**0089_MW193_210830**	**Normal**	**EP2110020**	1.08	1.31	8.93	0.78	4.45	<0.02	0.3	0.43	2.38	0.22	*0.60*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**30 Aug 2021**	**0089_QC113_210830**	**Field Duplicate**	**EP2110020**	1.07	1.21	8.17	0.80	3.75	<0.02	0.2	0.42	2.36	0.22	*0.60*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**30 Aug 2021**	**0089_QC213_210830**	**Interlab Duplicate**	**820919**	1.0	0.75	7.6	0.81	5.4	<0.01	0.24	0.45	2.7	0.23	*0.64*	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.1
WWTP	**MW193**	**10 Jan 2022**	**0089_MW193_220110**	**Normal**	**EP2200211**	0.55	0.45	5.67	0.25	0.93	<0.02	0.1	0.20	1.28	0.09	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**15 Mar 2022**	**0089_MW193_220315**	**Normal**	**EP2203018**	1.11	1.42	11.9	0.52	1.86	<0.02	0.2	0.46	3.19	0.24	*0.74*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**07 Jun 2022**	**0089_MW193_220607**	**Normal**	**EP2206883**	0.61	0.74	8.14	0.52	1.76	<0.02	0.2	0.33	1.50	0.14	*0.60*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**05 Sep 2022**	**0089_MW193_220905**	**Normal**	**EP2211340**	0.55	0.97	9.84	0.65	3.08	<0.02	0.2	0.27	1.60	0.12	0.52	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**12 Dec 2022**	**0089_MW193_221212**	**Normal**	**EP2216876**	0.37	0.47	4.81	0.26	1.34	<0.02	<0.1	0.22	0.81	0.08	0.29	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**13 Mar 2023**	**0089_MW193_230313**	**Normal**	**EP2303084**	0.56	0.51	6.53	0.49	1.67	<0.02	0.1	0.20	1.07	0.10	0.39	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**06 Jun 2023**	**0089_MW193_230606**	**Normal**	**EP2307415**	0.31	0.38	4.11	0.31	1.90	<0.02	<0.1	0.14	0.69	0.06	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW193**	**04 Sep 2023**	**0089_MW193_230904**	**Normal**	**EP2312225**	0.16	0.26	2.25	0.16	1.34	<0.02	<0.1	0.06	0.40	0.05	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**08 Aug 2017**	**0089_MW195_D_170808**	**Normal**	**199212**	0.002	0.002	0.021	<0.001	<0.001	<0.002	<0.002	<0.002	0.005	0.001	0.006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW195D**	**08 Aug 2017**	**0089_QC1MW_S_170808**	**Field Duplicate**	**199212**	0.002	0.002	0.019	<0.001	<0.001	<0.002	<0.002	<0.002	0.005	0.001	0.006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW195D**	**08 Aug 2017**	**0089_QC2MW_170808**	**Interlab Duplicate**	**558019**	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW195D**	**08 Jan 2020**	**0089_MW195-D_200108**	**Normal**	**EP2000186**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	0.20	0.24	0.05	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	10.9	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**31 Mar 2020**	**0089_MW195_D_200331**	**Normal**	**EP2003364**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**15 Jul 2020**	**0089_MW195_D_200715**	**Normal**	**EP2007385**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**21 Sep 2020**	**0089_MW195-D_200921**	**Normal**	**EP2010093**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	0.08	0.06	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.40	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**16 Dec 2020**	**0089_MW195D_201216**	**Normal**	**EP2014087**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**16 Mar 2021**	**0089_MW195D_210316**	**Normal**	**EP2102833**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**16 Mar 2021**	**0089_QC115_210316**	**Field Duplicate**	**EP2102833**	0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	0.26	0.18	0.14	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.36	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**16 Mar 2021**	**0089_QC215_210316**	**Interlab Duplicate**	**781350**	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.07	0.18	0.13	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.16	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW195D**	**08 Jun 2021**	**0089_QC212_210609**	**Interlab Duplicate**	**802464**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	0.11	0.09	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.2	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW195D**	**09 Jun 2021**	**0089_MW195D_210609**	**Normal**	**EP2106514**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	0.10	0.08	0.05	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	2.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**09 Jun 2021**	**0089_QC112_210609**	**Field Duplicate**	**EP2106514**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	0.14	0.11	0.07	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	2.52	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**30 Aug 2021**	**0089_MW195D_210830**	**Normal**	**EP2110020**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**30 Aug 2021**	**0089_QC111_210830**	**Field Duplicate**	**EP2110020**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**30 Aug 2021**	**0089_QC211_210830**	**Interlab Duplicate**	**820919**	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW195D**	**10 Jan 2022**	**0089_MW195D_220110**	**Normal**	**EP2200216**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**15 Mar 2022**	**0089_MW195D_220315**	**Normal**	**EP2203018**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	0.04	0.04	0.04	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**07 Jun 2022**	**0089_MW195D_220607**	**Normal**	**EP2206883**	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	0.08	0.07	0.08	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**05 Sep 2022**	**0089_MW195D_220905**	**Normal**	**EP2211340**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**12 Dec 2022**	**0089_MW195D_221212**	**Normal**	**EP2216876**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**12 Dec 2022**	**0089_QC111_221212**	**Field Duplicate**	**EP2216876**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**12 Dec 2022**	**0089_QC211_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW195D**	**13 Mar 2023**	**0089_MW195D_230313**	**Normal**	**EP2303084**	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	0.08	0.07	0.10	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**06 Jun 2023**	**0089_MW195D_230606**	**Normal**	**EP2307415**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**04 Sep 2023**	**0089_MW195D_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**04 Sep 2023**	**0089_QC105_230904**	**Field Duplicate**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195D**	**04 Sep 2023**	**0089_QC205_230904**	**Interlab Duplicate**	**1023399**	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW195S**	**08 Aug 2017**	**0089_MW195_S_170808**	**Normal**	**199212**	0.007	0.009	0.003	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW195S**	**18 Sep 2017**	**0089_MW195_S_170918**	**Normal**	**176030**	0.006	0.007	0.010	<0.001	0.004	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW195S**	**18 Sep 2017**	**0089_QC1MW_170918**	**Field Duplicate**	**176030**	0.006	0.008	0.004	<0.001	0.003	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW195S**	**18 Sep 2017**	**0089_QC2MW_170918**	**Interlab Duplicate**	**564343**	<0.01	<0.01	0.10	0.09	5.1	<0.01	<0.05	<0.01	0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW195S**	**19 Oct 2017**	**0089_MW195_S_171019**	**Normal**	**178275**	0.007	0.011	0.006	<0.001	0.004	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.01	<0.01	<0.05	<0.001	<0.001	<0.001	<0.002	<0.01	<0.005	<0.002
WWTP	**MW195S**	**19 Oct 2017**	**0089_QC1MW_171019**	**Field Duplicate**	**178275**	0.007	0.011	0.003	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.01	<0.02	<0.1	<0.001	<0.001	<0.001	<0.002	<0.01	<0.005	<0.002
WWTP	**MW195S**	**19 Oct 2017**	**0089_QC2MW_171019**	**Interlab Duplicate**	**568924**	0.04	0.03	0.04	<0.01	0.01	<0.01	<0.05	0.03	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW195S**	**15 Nov 2017**	**0089_MW195_S_171115**	**Normal**	**203378**	0.007	0.011	0.003	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW195S**	**15 Nov 2017**	**0089_QC1MW_171115**	**Field Duplicate**	**203378**	0.007	0.009	0.003	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW195S**	**15 Nov 2017**	**0089_QC2MW_171115**	**Interlab Duplicate**	**573296**	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW195S**	**07 Dec 2017**	**0089_MW195_S_171207**	**Normal**	**204323**	0.010	0.013	0.006	0.002	0.042	<0.002	<0.002	<0.002	<0.001	<0.001	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW195S**	**07 Dec 2017**	**0089_QC1MW_171207**	**Field Duplicate**	**204323**	0.009	0.008	0.004	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW195S**	**07 Dec 2017**	**0089_QC2MW_171207**	**Interlab Duplicate**	**576599**	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW195S**	**16 Jan 2018**	**0089_MW195_S_180116**	**Normal**	**205631**	0.008	0.013	0.002	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																									
WWTP	**MW195S**	**15 Mar 2022**	**0089_QC111_220315**	**Field Duplicate**	**EP2203018**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195S**	**15 Mar 2022**	**0089_QC211_220315**	**Interlab Duplicate**	**872903**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05
WWTP	**MW195S**	**07 Jun 2022**	**0089_MW195S_220607**	**Normal**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195S**	**07 Jun 2022**	**0089_QC111_220607**	**Field Duplicate**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195S**	**07 Jun 2022**	**0089_QC211_220607**	**Interlab Duplicate**	**896805**	<0.002	0.002	0.013	<0.002	0.006	<0.004	<0.008	<0.002	0.002	<0.004	0.012	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004
WWTP	**MW195S**	**05 Sep 2022**	**0089_MW195S_220905**	**Normal**	**EP2211340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195S**	**12 Dec 2022**	**0089_MW195S_221212**	**Normal**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195S**	**13 Mar 2023**	**0089_MW195S_230313**	**Normal**	**EP2303084**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195S**	**13 Mar 2023**	**0089_QC113_230313**	**Field Duplicate**	**EP2303084**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195S**	**13 Mar 2023**	**0089_QC213_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05
WWTP	**MW195S**	**06 Jun 2023**	**0089_MW195S_230606**	**Normal**	**EP2307415**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195S**	**06 Jun 2023**	**0089_QC109_230606**	**Field Duplicate**	**EP2307415**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW195S**	**06 Jun 2023**	**0089_QC209_230606**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05
WWTP	**MW196**	**08 Aug 2017**	**0089_MW196_S_170808**	**Normal**	**199212**	<0.001	<0.001	0.002	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW196**	**02 Apr 2020**	**0089_MW196_200402**	**Normal**	**EP2003472**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**22 Jul 2020**	**0089_MW196_200722**	**Normal**	**EP2007667**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**24 Sep 2020**	**0089_MW196_200924**	**Normal**	**EP2010271**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**16 Dec 2020**	**0089_MW196_201216**	**Normal**	**EP2014087**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**16 Dec 2020**	**0089_QC116_201216**	**Field Duplicate**	**EP2014087**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**16 Dec 2020**	**0089_QC216_201116**	**Interlab Duplicate**	**765054**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05
WWTP	**MW196**	**10 Jun 2021**	**0089_MW196_210610**	**Normal**	**EP2106579**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**30 Aug 2021**	**0089_MW196_210830**	**Normal**	**EP2110019**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**30 Aug 2021**	**0089_QC112_210830**	**Field Duplicate**	**EP2110019**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**30 Aug 2021**	**0089_QC212_210830**	**Interlab Duplicate**	**820919**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1
WWTP	**MW196**	**13 Jan 2022**	**0089_MW196_220113**	**Normal**	**EP2200340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**14 Mar 2022**	**0089_MW196_220314**	**Normal**	**EP2202975**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**14 Mar 2022**	**0089_QC108_220314**	**Field Duplicate**	**EP2202975**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**14 Mar 2022**	**0089_QC208_220314**	**Interlab Duplicate**	**872911**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05
WWTP	**MW196**	**06 Sep 2022**	**0089_MW196_220906**	**Normal**	**EP2211389**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**13 Dec 2022**	**0089_MW196_221213**	**Normal**	**EP2216929**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**13 Mar 2023**	**0089_MW196_230313**	**Normal**	**EP2303119**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW196**	**06 Jun 2023**	**0089_MW196_230606**	**Normal**	**EP2307463**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW197**	**09 Aug 2017**	**0089_MW197_S_170809**	**Normal**	**199252**	0.002	0.001	0.008	<0.001	0.002	<0.002	0.002	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW197**	**18 Sep 2017**	**0089_MW197_S_170918**	**Normal**	**176030**	<0.001	<0.001	<0.001	<0.001	0.003	<0.002	0.008	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW197**	**19 Oct 2017**	**0089_MW197_S_171019**	**Normal**	**178275**	0.001	<0.001	0.002	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW197**	**15 Nov 2017**	**0089_MW197_S_171115**	**Normal**	**203378**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW197**	**07 Dec 2017**	**0089_MW197_S_171207**	**Normal**	**204323**	<0.001	<0.001	0.004	0.003	0.040	<0.002	0.002	<0.002	<0.001	<0.001	0.004	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW197**	**16 Jan 2018**	**0089_MW197_S_180116**	**Normal**	**205631**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW197**	**31 Mar 2020**	**0089_MW197_200331**	**Normal**	**EP2003374**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW197**	**15 Jul 2020**	**0089_MW197_200715**	**Normal**	**EP2007382**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW197**	**16 Mar 2021**	**0089_MW197_210316**	**Normal**	**EP2102833**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW197**	**09 Jun 2021**	**0089_MW197_210609**	**Normal**	**EP2106514**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW197**	**01 Sep 2021**	**0089_MW197_210901**	**Normal**	**EP2110159**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW197**	**07 Jun 2022**	**0089_MW197_220607**	**Normal**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW197**	**05 Sep 2022**	**0089_MW197_220905**	**Normal**	**EP2211340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW197**	**12 Dec 2022**	**0089_MW197_221212**	**Normal**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW197**	**12 Dec 2022**	**0089_QC115_221212**	**Field Duplicate**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW197**	**12 Dec 2022**	**0089_QC215_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05
WWTP	**MW197**	**14 Mar 2023**	**0089_MW197_230314**	**Normal**	**EP2303177**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW197**	**07 Jun 2023**	**0089_MW197_230607**	**Normal**	**EP2307555**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**08 Aug 2017**	**0089_MW199_S_170808**	**Normal**	**199212**	<0.001	<0.001	0.005	<0.001	0.006	<0.002	<0.002	<0.002	0.004	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW199**	**18 Sep 2017**	**0089_MW199_S_170918**	**Normal**	**176030**	<0.001	<0.001	0.002	<0.001	0.003	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW199**	**19 Oct 2017**	**0089_MW199_S_171019**	**Normal**	**178275**	<0.001	<0.001	0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.01	<0.02	<0.1	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW199**	**15 Nov 2017**	**0089_MW199_S_171115**	**Normal**	**203378**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW199**	**07 Dec 2017**	**0089_MW199_S_171207**	**Normal**	**204323**	<0.001	<0.001	0.004	0.001	0.043	<0.002	0.003	<0.002	0.001	<0.001	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW199**	**16 Jan 2018**	**0089_MW199_S_180116**	**Normal**	**205631**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW199**	**08 Jan 2020**	**0089_MW199_200108**	**Normal**	**EP2000186**	<0.02	<0.02	0.03	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**31 Mar 2020**	**0089_MW199_200331**	**Normal**	**EP2003364**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**15 Jul 2020**	**0089_MW199_200715**	**Normal**	**EP2007385**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**21 Sep 2020**	**0089_MW199_200921**	**Normal**	**EP2010093**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**16 Dec 2020**	**0089_MW199_201216**	**Normal**	**EP2014087**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**30 Aug 2021**	**0089_MW199_210830**	**Normal**	**EP2110019**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**10 Jan 2022**	**0089_MW199_220110**	**Normal**	**EP2200216**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**17 Mar 2022**	**0089_MW199_220317**	**Normal**	**EP2203138**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**07 Jun 2022**	**0089_MW199_220607**	**Normal**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**07 Jun 2022**	**0089_QC109_220607**	**Field Duplicate**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**07 Jun 2022**	**0089_QC209_220607**	**Interlab Duplicate**	**896805**	<0.002	<0.002	<0.002	<0.002	0.005	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004
WWTP	**MW199**	**05 Sep 2022**	**0089_MW199_220905**	**Normal**	**EP2211340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**05 Sep 2022**	**0089_QC111_220905**	**Field Duplicate**	**EP2211340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**05 Sep 2022**	**0089_QC211_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05
WWTP	**MW199**	**12 Dec 2022**	**0089_MW199_221212**	**Normal**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**12 Dec 2022**	**0089_QC108_221212**	**Field Duplicate**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**12 Dec 2022**	**0089_QC208_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05
WWTP	**MW199**	**13 Mar 2023**	**0089_MW199_230313**	**Normal**	**EP2303084**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW199**	**13 Mar 2023**	**0089_QC111_230313**	**Field Duplicate**	**EP2303084**

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																									
WWTP	**MW200**	**16 Mar 2021**	**0089_MW200_210316**	**Normal**	**EP2102833**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW200**	**09 Jun 2021**	**0089_MW200_210609**	**Normal**	**EP2106514**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW200**	**01 Sep 2021**	**0089_MW200_210901**	**Normal**	**EP2110159**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW200**	**10 Jan 2022**	**0089_MW200_220110**	**Normal**	**EP2200216**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW200**	**14 Mar 2022**	**0089_MW200_220314**	**Normal**	**EP2202976**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW200**	**07 Jun 2022**	**0089_MW200_220607**	**Normal**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW200**	**05 Sep 2022**	**0089_MW200_220905**	**Normal**	**EP2211340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW200**	**12 Dec 2022**	**0089_MW200_221212**	**Normal**	**EP2216876**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW200**	**14 Mar 2023**	**0089_MW200_230314**	**Normal**	**EP2303177**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW200**	**07 Jun 2023**	**0089_MW200_230607**	**Normal**	**EP2307555**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW200**	**05 Sep 2023**	**0089_MW200_230905**	**Normal**	**EP2312170**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**09 Aug 2017**	**0089_MW202_S_170809**	**Normal**	**199252**	0.022	0.020	0.13	0.007	0.060	<0.002	0.007	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW202**	**18 Sep 2017**	**0089_MW202_S_170918**	**Normal**	**176030**	0.012	0.011	0.10	0.007	0.047	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW202**	**19 Oct 2017**	**0089_MW202_S_171019**	**Normal**	**178275**	0.009	0.008	0.078	0.009	0.063	<0.002	<0.002	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.01	<0.02	<0.1	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW202**	**15 Nov 2017**	**0089_MW202_S_171115**	**Normal**	**203378**	0.020	0.017	0.080	0.009	0.054	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW202**	**07 Dec 2017**	**0089_MW202_S_171207**	**Normal**	**204323**	0.011	0.007	0.064	0.009	0.092	<0.002	<0.002	<0.002	<0.001	<0.001	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW202**	**16 Jan 2018**	**0089_MW202_S_180116**	**Normal**	**205631**	0.009	0.009	0.074	0.013	0.050	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW202**	**31 Mar 2020**	**0089_MW202_200331**	**Normal**	**EP2003374**	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**31 Mar 2020**	**0089_QC103_200331**	**Field Duplicate**	**EP2003374**	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**31 Mar 2020**	**0089_QC203_200331**	**Interlab Duplicate**	**711434**	<0.01	<0.01	0.03	<0.01	0.03	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW202**	**22 Jul 2020**	**0089_MW202_200722**	**Normal**	**EP2007667**	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**21 Sep 2020**	**0089_MW202_200921**	**Normal**	**EP2010077**	<0.02	<0.02	0.07	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**21 Sep 2020**	**0089_QC112_200921**	**Field Duplicate**	**EP2010077**	<0.02	<0.02	0.06	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**22 Sep 2020**	**0089_QC212_200921**	**Interlab Duplicate**	**746269**	<0.01	<0.01	0.05	<0.01	0.04	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW202**	**16 Dec 2020**	**0089_MW202_201216**	**Normal**	**EP2014087**	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**15 Mar 2021**	**0089_MW202_210315**	**Normal**	**EP2102755**	<0.02	<0.02	0.03	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**10 Jun 2021**	**0089_MW202_210610**	**Normal**	**EP2106588**	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**30 Aug 2021**	**0089_MW202_210830**	**Normal**	**EP2110019**	<0.02	<0.02	0.04	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**12 Jan 2022**	**0089_MW202_220112**	**Normal**	**EP2200288**	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**18 Mar 2022**	**0089_MW202_220318**	**Normal**	**EP2203194**	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**08 Jun 2022**	**0089_MW202_220608**	**Normal**	**EP2206971**	<0.02	<0.02	0.04	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**05 Sep 2022**	**0089_MW202_220905**	**Normal**	**EP2211345**	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**12 Dec 2022**	**0089_MW202_221212**	**Normal**	**EP2216878**	<0.02	<0.02	0.03	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**13 Mar 2023**	**0089_MW202_230313**	**Normal**	**EP2303085**	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**07 Jun 2023**	**0089_MW202_230607**	**Normal**	**EP2307497**	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW202**	**05 Sep 2023**	**0089_MW202_230905**	**Normal**	**EP2312177**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**09 Aug 2017**	**0089_MW203_S_170809**	**Normal**	**199252**	0.041	0.019	0.024	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
WWTP	**MW203**	**08 Jan 2020**	**0089_MW203_200108**	**Normal**	**EP2000182**	0.03	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**31 Mar 2020**	**0089_MW203_200331**	**Normal**	**EP2003374**	0.03	0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**31 Mar 2020**	**0089_QC102_200331**	**Field Duplicate**	**EP2003374**	0.04	0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**31 Mar 2020**	**0089_QC202_200331**	**Interlab Duplicate**	**711434**	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**MW203**	**15 Jul 2020**	**0089_MW203_200715**	**Normal**	**EP2007385**	0.04	0.04	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**22 Sep 2020**	**0089_MW203_200922**	**Normal**	**EP2010141**	0.04	0.02	0.03	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**16 Dec 2020**	**0089_MW203_201216**	**Normal**	**EP2014087**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**16 Mar 2021**	**0089_MW203_210316**	**Normal**	**EP2102837**	<0.02	0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**09 Jun 2021**	**0089_MW203_210609**	**Normal**	**EP2106514**	<0.02	<0.02	0.09	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**30 Aug 2021**	**0089_MW203_210830**	**Normal**	**EP2110019**	<0.02	0.02	0.09	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**10 Jan 2022**	**0089_MW203_220110**	**Normal**	**EP2200216**	0.02	0.02	0.07	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**17 Mar 2022**	**0089_MW203_220317**	**Normal**	**EP2203138**	<0.02	<0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**07 Jun 2022**	**0089_MW203_220607**	**Normal**	**EP2206880**	<0.02	<0.02	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**07 Jun 2022**	**0089_QC115_220607**	**Field Duplicate**	**EP2206880**	<0.02	<0.02	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**07 Jun 2022**	**0089_QC215_220607**	**Interlab Duplicate**	**896805**	0.009	0.007	0.026	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	0.036	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004
WWTP	**MW203**	**06 Sep 2022**	**0089_MW203_220906**	**Normal**	**EP2211390**	<0.02	<0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**12 Dec 2022**	**0089_MW203_221212**	**Normal**	**EP2216878**	<0.02	<0.02	0.12	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**13 Mar 2023**	**0089_MW203_230313**	**Normal**	**EP2303085**	0.02	<0.02	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**06 Jun 2023**	**0089_MW203_230606**	**Normal**	**EP2307415**	<0.02	<0.02	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
WWTP	**MW203**	**05 Sep 2023**	**0089_MW203_230905**	**Normal**	**EP2312183**	0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW214**	**02 Aug 2017**	**0089_MW214_S_170802**	**Normal**	**198991**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW214**	**01 Sep 2021**	**0089_MW214_210901**	**Normal**	**EP2110159**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW214**	**13 Jan 2022**	**0089_MW214_220113**	**Normal**	**EP2200340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW214**	**16 Mar 2022**	**0089_MW214_220316**	**Normal**	**EP2203057**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW214**	**07 Jun 2022**	**0089_MW214_220607**	**Normal**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW214**	**06 Sep 2022**	**0089_MW214_220906**	**Normal**	**EP2211400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW214**	**13 Dec 2022**	**0089_MW214_221213**	**Normal**	**EP2216929**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW214**	**14 Mar 2023**	**0089_MW214_230314**	**Normal**	**EP2303177**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW214**	**08 Jun 2023**	**0089_MW214_230608**	**Normal**	**EP2307588**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW214**	**04 Sep 2023**	**0089_MW214_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW215**	**02 Aug 2017**	**0089_MW215_S_170802**	**Normal**	**198991**	0.013	0.011	0.003	<0.001	<0.001	<0.002	0.005	<0.002	0.003	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW215**	**01 Sep 2021**	**0089_MW215_210901**	**Normal**	**EP2110159**	0.03	0.03	0.35	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW215**	**13 Jan 2022**	**0089_MW215_220113**	**Normal**	**EP2200340**	0.04	0.06	0.47	<0.02	<0.01	<0.02	<0.1	0.04	0.13	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW215**	**16 Mar 2022**	**0089_MW215_220316**	**Normal**	**EP2203057**	0.16	0.12	0.61	<0.02	<0.01	<0.02	<0.1	0.10	0.42	0.03	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW215**	**07 Jun 2022**	**0089_MW215_220607**	**Normal**	**EP2206888**	0.14	0.17	0.80	<0.02	<0.01	<0.02	<0.1	0.12	0.42	0.05	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW215**	**06 Sep 2022**	**0089_MW215_220906**	**Normal**	**EP2211400**	0.09	0.13	0.73	<0.02	<0.01	<0.02	<0.1	0.07	0.24	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW215**	**13 Dec 2022**	**0089_MW215_221213**	**Normal**	**EP2216929**	<0.02	<0.02	0.24	<0.02	<0.01	<0.02	<0.1	0.04	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW215**	**14 Mar 2023**	**0089_MW215_230314**	**Normal**	**EP2303177**	0.04	0.06	0.45	<0.02	<0.01	<0.02	<0.1	0.04	0.12	0.02	<0.01	<0.02	<0.02	<0.02

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
HSF	**MW216**	**13 Jan 2022**	**0089_MW216_220113**	**Normal**	**EP2200340**	0.62	0.56	4.98	0.18	1.20	<0.02	1.1	4.08	3.08	0.48	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	2.23	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW216**	**16 Mar 2022**	**0089_MW216_220316**	**Normal**	**EP2203057**	0.53	0.69	3.65	0.15	0.86	<0.02	0.9	3.66	3.16	0.45	0.41	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	2.91	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW216**	**07 Jun 2022**	**0089_MW216_220607**	**Normal**	**EP2206888**	0.39	0.45	3.29	0.16	1.16	<0.02	0.9	3.60	2.23	0.30	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	2.95	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW216**	**05 Sep 2022**	**0089_MW216_220905**	**Normal**	**EP2211340**	0.32	0.47	3.21	0.11	0.98	<0.02	2.3	9.12	6.45	0.31	0.22	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.58	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW216**	**13 Dec 2022**	**0089_MW216_221213**	**Normal**	**EP2216929**	0.46	0.57	4.02	0.14	0.96	<0.02	8.3	27.3	15.0	0.51	0.32	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.92	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW216**	**14 Mar 2023**	**0089_MW216_230314**	**Normal**	**EP2303177**	0.20	0.25	2.12	0.07	0.50	<0.02	4.1	15.5	7.54	0.38	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.37	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW216**	**08 Jun 2023**	**0089_MW216_230608**	**Normal**	**EP2307588**	0.24	0.32	2.65	0.08	0.47	<0.02	3.8	8.91	8.65	0.50	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.92	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW216**	**04 Sep 2023**	**0089_MW216_230904**	**Normal**	**EP2312225**	0.13	0.14	1.53	0.06	0.33	<0.02	2.9	8.08	7.26	0.78	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.23	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**02 Aug 2017**	**0089_MW217_S_170802**	**Normal**	**198991**	0.011	0.017	<0.003	<0.001	0.16	<0.002	5.4	31	13	0.82	0.33	0.005	<0.002	<0.002	<0.005	<0.01	<0.05	1.2	9.6	0.093	<0.001	<0.01	<0.005	<0.002
HSF	**MW217**	**11 Sep 2017**	**0089_MW217_S_170911**	**Normal**	**175533**	0.11	0.12	0.097	<0.001	0.18	<0.002	3.3	5.9	6.8	0.79	0.24	0.016	<0.002	<0.002	<0.005	<0.01	<0.05	0.12	17	0.20	<0.001	<0.01	<0.005	<0.002
HSF	**MW217**	**11 Sep 2017**	**0089_QC1MW_170911**	**Field Duplicate**	**175533**	0.097	0.10	0.10	<0.001	0.17	<0.002	3.5	5.9	6.8	0.70	0.23	0.017	<0.002	<0.002	<0.005	<0.01	<0.05	0.12	17	0.18	<0.001	<0.01	<0.005	<0.002
HSF	**MW217**	**11 Sep 2017**	**0089_QC2MW_170911**	**Interlab Duplicate**	**562844**	0.04	0.02	0.12	<0.01	0.32	<0.01	2.6	11	6.2	1.3	0.27	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.09	3.3	0.48	<0.01	<0.05	<0.05	<0.05
HSF	**MW217**	**16 Oct 2017**	**0089_MW217_S_171016**	**Normal**	**177956**	0.045	0.066	0.24	<0.01	0.16	<0.04	1.7	7.0	5.3	0.84	0.27	<0.01	<0.02	<0.02	<0.1	<0.2	<1	0.031	13	0.11	<0.02	<0.1	<0.05	<0.02
HSF	**MW217**	**17 Nov 2017**	**0089_MW217_S_171117**	**Normal**	**203443**	0.16	0.20	0.19	0.010	0.24	<0.002	1.6	5.8	5.4	1.4	0.26	0.005	<0.002	<0.002	<0.005	<0.01	<0.05	0.047	11	0.10	<0.001	<0.01	<0.05	<0.002
HSF	**MW217**	**05 Dec 2017**	**0089_MW217_S_171205**	**Normal**	**204183**	0.059	0.070	0.044	0.006	0.17	<0.002	2.5	7.8	7.7	0.96	0.20	0.005	<0.002	<0.002	<0.005	<0.01	<0.05	0.16	12	0.10	<0.001	<0.01	<0.005	<0.002
HSF	**MW217**	**15 Jan 2018**	**0089_MW217_S_180115**	**Normal**	**205568**	0.019	0.068	0.012	<0.001	0.11	<0.002	2.9	11	10	1.4	0.27	0.006	<0.002	<0.002	<0.005	<0.01	<0.05	0.20	16	0.13	<0.001	<0.01	<0.005	<0.002
HSF	**MW217**	**19 Dec 2019**	**0089_MW217_191219**	**Normal**	**EP1913595**	<0.02	<0.02	0.02	<0.02	0.13	<0.02	0.2	2.33	2.43	0.68	0.32	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	32.1	0.55	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**31 Mar 2020**	**0089_MW217_200331**	**Normal**	**EP2003366**	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.1	0.44	0.51	0.18	0.22	0.07	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	21.0	0.74	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**22 Jul 2020**	**0089_MW217_200722**	**Normal**	**EP2007667**	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	0.4	3.29	4.07	0.77	0.29	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	34.3	0.26	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**22 Jul 2020**	**0089_QC114_200722**	**Field Duplicate**	**EP2007667**	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	0.4	3.41	4.26	0.82	0.30	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	37.4	0.33	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**22 Jul 2020**	**0089_QC214_200722**	**Interlab Duplicate**	**734409**	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	0.48	2.4	2.7	0.60	0.23	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	3.0	0.16	<0.01	<0.05	<0.05	<0.05
HSF	**MW217**	**24 Sep 2020**	**0089_MW217_200924**	**Normal**	**EP2010271**	<0.02	<0.02	0.04	<0.02	0.23	<0.02	0.5	3.21	2.66	0.62	0.33	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	26.2	0.26	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**15 Dec 2020**	**0089_MW217_201215**	**Normal**	**EP2014041**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	0.3	2.12	2.44	0.51	0.23	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	21.7	0.57	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**18 Mar 2021**	**0089_MW217_210318**	**Normal**	**EP2102955**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.9	2.56	3.14	0.62	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	28.5	0.34	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**09 Jun 2021**	**0089_MW217_210609**	**Normal**	**EP2106514**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	1.8	6.98	4.33	0.70	0.38	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	32.6	0.29	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**31 Aug 2021**	**0089_MW217_210831**	**Normal**	**EP2110064**	0.02	0.02	0.04	<0.02	0.04	<0.02	1.3	6.95	7.76	0.93	0.38	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	38.5	0.24	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**13 Jan 2022**	**0089_MW217_220113**	**Normal**	**EP2200339**	0.04	0.02	0.01	<0.02	0.04	<0.02	2.2	10.8	11.7	0.98	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	25.6	0.26	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**17 Mar 2022**	**0089_MW217_220317**	**Normal**	**EP2203138**	0.05	0.03	0.02	<0.02	0.09	<0.02	1.7	8.38	13.2	0.92	0.43	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	27.2	0.48	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**08 Jun 2022**	**0089_MW217_220608**	**Normal**	**EP2206971**	0.02	0.02	0.02	<0.02	0.06	<0.02	1.5	4.56	5.57	0.88	0.38	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	20.7	0.21	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**08 Sep 2022**	**0089_MW217_220908**	**Normal**	**EP2211535**	<0.02	0.04	0.05	<0.02	0.05	<0.02	1.0	4.61	4.44	1.23	0.37	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	12.5	0.24	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**13 Dec 2022**	**0089_MW217_221213**	**Normal**	**EP2216933**	<0.02	<0.02	0.03	<0.02	0.09	<0.02	0.5	1.86	1.63	0.50	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	10.2	0.30	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**15 Mar 2023**	**0089_MW217_230315**	**Normal**	**EP2303198**	0.03	0.03	0.02	<0.02	0.03	<0.02	1.9	8.73	9.30	0.90	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	21.0	0.21	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**08 Jun 2023**	**0089_MW217_230608**	**Normal**	**EP2307586**	<0.02	<0.02	0.02	<0.02	0.02	<0.02	1.7	7.97	5.63	0.87	0.37	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	19.2	0.30	<0.05	<0.02	<0.05	<0.02
HSF	**MW217**	**04 Sep 2023**	**0089_MW217_230904**	**Normal**	**EP2312225**	<0.02	<0.02	0.01	<0.02	0.03	<0.02	1.1	5.14	4.86	0.72	0.33	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	18.8	0.30	<0.05	<0.02	<0.05	<0.02
HSF	**MW220**	**26 Feb 2016**	**HDF_MB50**	**Normal**	**EP1601702**					4.4						0.15								<0.1	<0.1				
HSF	**MW220**	**04 Nov 2016**	**HSF_MB50**	**Normal**	**522565**					1.5						0.1								0.36					
HSF	**MW220**	**02 Aug 2017**	**0089_MW220_S_170802**	**Normal**	**198991**	0.072	0.12	0.65	0.016	0.87	<0.002	0.23	0.40	0.41	0.085	0.041	0.002	<0.002	<0.002	<0.005	<0.01	<0.05	0.004	0.15	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW220**	**11 Sep 2017**	**0089_MW220_S_170911**	**Normal**	**175533**	0.041	0.073	0.35	0.006	0.25	<0.002	0.16	0.25	0.32	0.11	0.021	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.050	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW220**	**16 Oct 2017**	**0089_MW220_S_171016**	**Normal**	**177956**	0.031	0.028	0.19	0.003	0.20	<0.002	0.15	0.15	0.17	0.059	0.014	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.029	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW220**	**17 Nov 2017**	**0089_MW220_S_171117**	**Normal**	**203443**	0.20	0.37	2.0	0.072	0.34	<0.002	0.20	0.34	0.59	0.12	0.10	0.002	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.44	<0.001	<0.001	<0.01	<0.05	<0.002
HSF	**MW220**	**05 Dec 2017**	**0089_MW220_S_171205**	**Normal**	**204183**	0.16	0.32	1.8	0.088	0.36	<0.002	0.19	0.24	0.53	0.11	0.12	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.46	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW220**	**05 Dec 2017**	**0089_QC1MW_171205**	**Field Duplicate**	**204183**	0.16	0.31	1.8	0.20	0.39	<0.002	0.19	0.20	0.58	0.12	0.12	0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.47	<0.001	<0.001	<0.01	<0.01	<0.002
HSF	**MW220**	**05 Dec 2017**	**0089_QC2MW_171205**	**Interlab Duplicate**	**576083**	0.11	0.19	2.1	0.07	0.46	<0.01	0.18	0.40	0.53	0.14	0.13	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.62	<0.01	<0.01	<0.05	<0.05	<0.05
HSF	**MW220**	**15 Jan 2018**	**0089_MW220_S_180115**	**Normal**	**205568**	0.28	0.77	5.2	0.16	1.2	<0.002	0.26	0.61	1.2	0.30	0.27	0.003	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	1.1	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW220**	**09 Jun 2021**	**0089_MW220_210609**	**Normal**	**EP2106514**	0.18	0.17	3.61	0.46	9.38	<0.02	0.2	0.40	0.55	0.19	*0.60*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.15	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW220**	**13 Jan 2022**	**0089_MW220_220113**	**Normal**	**EP2200339**	0.58	0.27	5.45	0.69	72.0	<0.02	0.4	0.85	1.88	0.28	*0.64*	0.09	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW220**	**08 Jun 2022**	**0089_MW220_220608**	**Normal**	**EP2206971**	0.25	0.18	4.02	0.53	23.5	<0.02	0.2	0.49	0.94	0.19	0.51	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW220**	**08 Sep 2022**	**0089_MW220_220908**	**Normal**	**EP2211535**	0.26	0.20	4.21	0.55	30.2	<0.02	0.2	0.51	1.08	0.21	0.45	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.14	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW220**	**13 Dec 2022**	**0089_MW220_221213**	**Normal**	**EP2216933**	0.14	0.08	1.22	0.21	22.4	<0.02	0.2	0.27	0.39	0.08	0.16	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW220**	**15 Mar 2023**	**0089_MW220_230315**	**Normal**	**EP2303198**	0.06	0.05	0.66	0.10	12.0	<0.02	0.2	0.21	0.27	0.07	0.10	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW220**	**08 Jun 2023**	**0089_MW220_230608**	**Normal**	**EP2307586**	0.05	0.05	0.82	0.10	7.27	<0.02	0.1	0.17	0.24	0.10	0.14	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW220**	**04 Sep 2023**	**0089_MW220_230904**	**Normal**	**EP2312225**	0.03	0.02	0.32	0.06	4.86	<0.02	<0.1	0.08	0.12	0.04	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**09 Aug 2017**	**0089_MW224_S_170809**	**Normal**	**199252**	0.005	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW224**	**19 Dec 2019**	**0089_MW224_191219**	**Normal**	**EP1913595**	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.1	<0.02	0.02	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.96	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**31 Mar 2020**	**0089_MW224_200331**	**Normal**	**EP2003366**	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**22 Jul 2020**	**0089_MW224_200722**	**Normal**	**EP2007667**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**24 Sep 2020**	**0089_MW224_200924**	**Normal**	**EP2010273**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**15 Dec 2020**	**0089_MW224_201215**	**Normal**	**EP2014041**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**18 Mar 2021**	**0089_MW224_210318**	**Normal**	**EP2102955**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**09 Jun 2021**	**0089_MW224_210609**	**Normal**	**EP2106514**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**31 Aug 2021**	**0089_MW224_210831**	**Normal**	**EP2110064**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**12 Jan 2022**	**0089_QC218_220113**	**Interlab Duplicate**	**855202**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
HSF	**MW224**	**13 Jan 2022**	**0089_MW224_220113**	**Normal**	**EP2200339**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**13 Jan 2022**	**0089_QC118_220113**	**Field Duplicate**	**EP2200339**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**17 Mar 2022**	**0089_MW224_220317**	**Normal**	**EP2203138**	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**08 Jun 2022**	**0089_MW224_220608**	**Normal**	**EP2206971**	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**08 Sep 2022**	**0089_MW224_220908**	**Normal**	**EP2211535**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**13 Dec 2022**	**0089_MW224_221213**	**Normal**	**EP2216933**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**15 Mar 2023**	**0089_MW224_230315**	**Normal**	**EP2303198**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**08 Jun 2023**	**0089_MW224_230608**	**Normal**	**EP2307586**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW224**	**04 Sep 2023**	**0089_MW224_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW225**	**02 Aug 2017**	**0089_MW225_S_170802**	**Normal**	**198991**	<0.001	<0.001	<0.001	<0.001	0.003	<0.002	0.006	0.021	0.011	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	0.001	0.029	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW225**	**11 Sep 2017**	**0089_MW225_S_170911**	**Normal**	**175533**	<0.001	<0.001	0.001	<0.001	0.009	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW225**	**19 Oct 2017**	**0089_MW225_S_171019**	**Normal**	**178275**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW225**	**17 Nov 2017**	**0089_MW225_S_171117**	**Normal**	**203443**	<0.001	<0.001	0.002	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.002	<0.001	<0.001	<0.01	<0.05	<0.002
HSF	**MW225**	**05 Dec 2017**	**0089_MW225_S_171205**	**Normal**	**204183**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW225**	**15 Jan 2018**	**0089_MW225_S_180115**	**Normal**	**205568

Table 1 - Groundwater Analytical Results

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water											*0.56*													
PFAS NEMP 2020 Freshwater 99%					0.00023*						19													
PFAS NEMP 2020 Recreational Water											**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																			
HSF	**MW226**	**19 Oct 2017**	**0089_MW226_S_171019**	**Normal**	**178275**	0.002	<0.001	0.003	<0.001	0.002	<0.002	0.005	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW226**	**17 Nov 2017**	**0089_MW226_S_171117**	**Normal**	**203443**	0.006	0.002	0.003	<0.001	<0.001	<0.002	<0.004	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
HSF	**MW226**	**05 Dec 2017**	**0089_MW226_S_171205**	**Normal**	**204183**	<0.005	<0.005	0.002	<0.001	<0.001	<0.002	0.006	<0.01	<0.005	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.005	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW226**	**15 Jan 2018**	**0089_MW226_S_180115**	**Normal**	**205568**	0.002	0.001	0.002	<0.001	0.001	<0.002	0.020	<0.002	<0.001	0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW226**	**14 Jan 2020**	**0089_MW226_200114**	**Normal**	**EP2000432**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.48	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**02 Apr 2020**	**0089_MW226_200402**	**Normal**	**EP2003472**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**02 Apr 2020**	**0089_QC101_200402**	**Field Duplicate**	**EP2003472**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**02 Apr 2020**	**0089_QC201_200402**	**Interlab Duplicate**	**712006**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
HSF	**MW226**	**21 Jul 2020**	**0089_MW226_200721**	**Normal**	**EP2007611**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**22 Sep 2020**	**0089_MW226_200922**	**Normal**	**EP2010143**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**15 Dec 2020**	**0089_MW226_201215**	**Normal**	**EP2014042**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**17 Mar 2021**	**0089_MW226_210317**	**Normal**	**EP2102900**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**10 Jun 2021**	**0089_MW226_210610**	**Normal**	**EP2106588**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**31 Aug 2021**	**0089_MW226_210831**	**Normal**	**EP2110071**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**13 Jan 2022**	**0089_MW226_220113**	**Normal**	**EP2200340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**16 Mar 2022**	**0089_MW226_220316**	**Normal**	**EP2203057**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**07 Jun 2022**	**0089_MW226_220607**	**Normal**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**06 Sep 2022**	**0089_MW226_220906**	**Normal**	**EP2211390**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**13 Dec 2022**	**0089_MW226_221213**	**Normal**	**EP2216933**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**14 Mar 2023**	**0089_MW226_230314**	**Normal**	**EP2303178**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**08 Jun 2023**	**0089_MW226_230608**	**Normal**	**EP2307587**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW226**	**04 Sep 2023**	**0089_MW226_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**02 Aug 2017**	**0089_MW227_S_170802**	**Normal**	**198991**	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	0.009	0.033	0.017	0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	0.002	0.033	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW227**	**11 Sep 2017**	**0089_MW227_S_170911**	**Normal**	**175533**	<0.001	<0.001	0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW227**	**19 Oct 2017**	**0089_MW227_S_171019**	**Normal**	**178275**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW227**	**17 Nov 2017**	**0089_MW227_S_171117**	**Normal**	**203443**	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.004	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW227**	**05 Dec 2017**	**0089_MW227_S_171205**	**Normal**	**204183**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW227**	**15 Jan 2018**	**0089_MW227_S_180115**	**Normal**	**205568**	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW227**	**01 Apr 2020**	**0089_MW227_200401**	**Normal**	**EP2003417**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**01 Apr 2020**	**0089_QC104_200401**	**Field Duplicate**	**EP2003417**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**01 Apr 2020**	**0089_QC204_200401**	**Interlab Duplicate**	**711709**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
HSF	**MW227**	**22 Jul 2020**	**0089_MW227_200722**	**Normal**	**EP2007648**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**21 Sep 2020**	**0089_MW227_200921**	**Normal**	**EP2010085**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**15 Dec 2020**	**0089_MW227_201215**	**Normal**	**EP2014051**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**15 Mar 2021**	**0089_MW227_210315**	**Normal**	**EP2102752**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**10 Jun 2021**	**0089_MW227_210610**	**Normal**	**EP2106588**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**31 Aug 2021**	**0089_MW227_210831**	**Normal**	**EP2110071**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**14 Jan 2022**	**0089_MW227_220114**	**Normal**	**EP2200399**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**16 Mar 2022**	**0089_MW227_220316**	**Normal**	**EP2203057**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**07 Jun 2022**	**0089_MW227_220607**	**Normal**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**07 Sep 2022**	**0089_MW227_220907**	**Normal**	**EP2211611**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.10	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**13 Dec 2022**	**0089_MW227_221213**	**Normal**	**EP2216932**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**14 Mar 2023**	**0089_MW227_230314**	**Normal**	**EP2303178**	0.06	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**08 Jun 2023**	**0089_MW227_230608**	**Normal**	**EP2307587**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW227**	**05 Sep 2023**	**0089_MW227_230905**	**Normal**	**EP2312187**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**02 Aug 2017**	**0089_MW228_S_170802**	**Normal**	**198991**	0.002	<0.001	<0.001	<0.001	<0.001	<0.002	0.01	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW228**	**11 Sep 2017**	**0089_MW228_S_170911**	**Normal**	**175533**	0.004	<0.001	<0.001	<0.001	0.004	<0.002	0.051	0.02	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW228**	**19 Oct 2017**	**0089_MW228_S_171019**	**Normal**	**178275**	0.003	<0.001	<0.001	<0.001	<0.001	<0.002	0.077	0.044	0.009	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW228**	**17 Nov 2017**	**0089_MW228_S_171117**	**Normal**	**203443**	0.004	<0.001	<0.001	<0.001	<0.001	<0.002	0.11	0.041	0.009	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW228**	**05 Dec 2017**	**0089_MW228_S_171205**	**Normal**	**204183**	0.007	0.001	<0.001	<0.001	<0.001	<0.002	0.20	0.089	0.020	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW228**	**15 Jan 2018**	**0089_MW228_S_180115**	**Normal**	**205568**	0.002	<0.001	<0.001	<0.001	<0.001	<0.002	0.071	0.070	0.010	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW228**	**15 Jan 2018**	**0089_QC1MW_180115**	**Field Duplicate**	**205568**	0.002	<0.001	<0.001	<0.001	0.003	<0.002	0.080	0.072	0.010	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW228**	**15 Jan 2018**	**0089_QC2MW_180115**	**Interlab Duplicate**	**580891**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
HSF	**MW228**	**14 Jan 2020**	**0089_MW228_200114**	**Normal**	**EP2000432**	0.06	<0.02	<0.02	<0.02	<0.01	<0.02	1.1	12.0	11.0	1.42	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.50	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**01 Apr 2020**	**0089_MW228_200401**	**Normal**	**EP2003417**	0.11	0.04	0.03	<0.02	<0.01	<0.02	0.6	15.3	13.8	2.33	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**01 Apr 2020**	**0089_QC103_200401**	**Field Duplicate**	**EP2003417**	0.03	<0.02	<0.02	<0.02	<0.01	<0.02	0.3	5.80	4.24	0.75	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**01 Apr 2020**	**0089_QC203_200401**	**Interlab Duplicate**	**711709**	0.05	0.02	<0.01	<0.01	<0.01	<0.01	1.4	8.1	5.9	1.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
HSF	**MW228**	**22 Jul 2020**	**0089_MW228_200722**	**Normal**	**EP2007648**	0.02	<0.02	<0.02	<0.02	<0.01	<0.02	1.1	5.89	4.89	0.40	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**22 Jul 2020**	**0089_QC112_200722**	**Field Duplicate**	**EP2007648**	0.02	<0.02	<0.02	<0.02	<0.01	<0.02	1.2	6.04	5.01	0.44	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**22 Jul 2020**	**0089_QC212_200722**	**Interlab Duplicate**	**734409**	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.79	2.9	2.5	0.19	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
HSF	**MW228**	**21 Sep 2020**	**0089_MW228_200921**	**Normal**	**EP2010085**	0.06	<0.02	<0.02	<0.02	<0.01	<0.02	2.2	11.0	9.44	0.85	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**15 Dec 2020**	**0089_MW228_201215**	**Normal**	**EP2014047**	0.31	0.13	0.11	<0.02	<0.01	<0.02	4.2	14.0	15.0	3.42	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**15 Mar 2021**	**0089_MW228_210315**	**Normal**	**EP2102752**	0.10	0.04	0.03	<0.02	<0.01	<0.02	2.0	9.40	8.86	1.16	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**10 Jun 2021**	**0089_MW228_210610**	**Normal**	**EP2106588**	0.07	<0.02	<0.02	<0.02	<0.01	<0.02	1.1	5.09	4.65	0.70	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**31 Aug 2021**	**0089_MW228_210831**	**Normal**	**EP2110071**	0.22	0.15	0.13	<0.02	<0.01	<0.02	2.3	10.4	10.4	2.55	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.40	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**14 Jan 2022**	**0089_MW228_220114**	**Normal**	**EP2200399**	0.21	0.11	0.10	<0.02	<0.01	<0.02	2.0	8.90	12.0	2.42	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.27	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**16 Mar 2022**	**0089_MW228_220316**	**Normal**	**EP2203057**	0.21	0.10	0.15	<0.02	<0.01	<0.02	2.1	8.23	10.8	2.38	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.23	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**07 Jun 2022**	**0089_MW228_220607**	**Normal**	**EP2206888**	0.11	0.08	0.09	<0.02	<0.01	<0.02	1.6	7.48	7.21	1.56	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.19	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**07 Sep 2022**	**0089_MW228_220907**	**Normal**	**EP2211495**	0.08	0.06	0.12	<0.02	<0.01	<0.02	0.7	2.90	3.03	0.94	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.24	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**13 Dec 2022**	**0089_MW228_221213**	**Normal**	**EP2216929**	0.17	0.10	0.23	<0.02	<0.01	<0.02	1.0	3.96	3.87	1.05	0.19	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.66	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**14 Mar 2023**	**0089_MW228_230314**	**Normal**	**EP2303178**	0.16	0.12	0.19	<0.02	<0.01	<0.02	1.4	4.84	5.00	1.18	0.23	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.91	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**08 Jun 2023**	**0089_MW228_230608**	**Normal**	**EP2307587**	0.14	0.12	0.16	<0.02	<0.01	<0.02	1.0	3.20	2.95	0.84	0.14	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.47	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW228**	**05 Sep 2023**	**0089_MW228_230905**	**Normal**	**EP2312187**	0.25	0.17	0.36	<0.02	<0.01	<0.02	1.0	3.16	3.70	0.97	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.45	<0.05	<0.05	<0.02	<0.05	<0.02
Infiltration Swale	**MW233**	**08 Aug 2017**	**0089_MW233_S_170808**	**Normal**	**199212**	0.011	0.016	0.21	0.002	0.2	<0.002	0.008	0.004	0.016	0.006	0.005	0.002	0.003	0.003	<0.005	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Infiltration Swale	**MW233**	**13 Sep 2017**	**0089_MW233_S_170913**	**Normal**	**175739**	0.007	0.01	0.11	0.002	0.26	<0.002	0.008	0.007	0.016	0.008	0.006	<0.001	<0.002	0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Infiltration Swale	**MW233**	**20 Oct 2017**	**0089_MW233_S_171020**

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
Infiltration Swale	**MW233**	**30 Aug 2021**	**0089_QC202_210830**	**Interlab Duplicate**	**820919**	<0.01	<0.01	0.06	<0.01	0.28	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Infiltration Swale	**MW233**	**10 Jan 2022**	**0089_MW233_220110**	**Normal**	**EP2200216**	<0.02	<0.02	0.01	<0.02	0.34	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Infiltration Swale	**MW233**	**17 Mar 2022**	**0089_MW233_220317**	**Normal**	**EP2203138**	<0.02	<0.02	0.01	<0.02	0.24	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Infiltration Swale	**MW233**	**08 Jun 2022**	**0089_MW233_220608**	**Normal**	**EP2206969**	<0.02	<0.02	0.02	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Infiltration Swale	**MW233**	**06 Sep 2022**	**0089_MW233_220906**	**Normal**	**EP2211390**	<0.02	<0.02	0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Infiltration Swale	**MW233**	**13 Dec 2022**	**0089_MW233_221213**	**Normal**	**EP2216932**	<0.02	<0.02	0.06	<0.02	0.17	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Infiltration Swale	**MW233**	**13 Mar 2023**	**0089_MW233_230313**	**Normal**	**EP2303119**	<0.02	<0.02	0.03	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Infiltration Swale	**MW233**	**06 Jun 2023**	**0089_MW233_230606**	**Normal**	**EP2307415**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Infiltration Swale	**MW233**	**04 Sep 2023**	**0089_MW233_230904**	**Normal**	**EP2312225**	<0.02	<0.02	0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**08 Aug 2017**	**0089_MW236_S_170808**	**Normal**	**199212**	0.68	2	31	0.11	12	<0.002	0.2	0.23	2.3	1.2	*1.1*	1.3	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.01	<0.001	<0.001	<0.01	<0.005	<0.002
Fuel Farm	**MW236**	**13 Sep 2017**	**0089_MW236_S_170913**	**Normal**	**175739**	1.8	4.6	32	0.23	12	<0.002	0.31	0.22	3.3	0.90	*1.1*	0.99	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.009	<0.001	<0.001	<0.01	<0.005	<0.002
Fuel Farm	**MW236**	**20 Oct 2017**	**0089_MW236_S_171020**	**Normal**	**178263**	1.4	3.8	27	0.14	18	<0.02	0.24	0.58	3.9	1.2	*1.2*	1.2	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02
Fuel Farm	**MW236**	**21 Nov 2017**	**0089_MW236_S_171121**	**Normal**	**203587**	1.6	4.1	26	0.26	16	<0.002	0.28	0.51	4.0	1.2	*0.99*	1.4	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.016	<0.001	<0.001	<0.01	<0.005	<0.002
Fuel Farm	**MW236**	**05 Dec 2017**	**0089_MW236_S_171205**	**Normal**	**204183**	2.3	5.9	29	0.21	16	<0.020	0.33	0.40	4.2	0.88	*1.1*	1.9	<0.02	<0.02	<0.050	<0.1	<0.5	<0.01	0.016	<0.01	<0.01	<0.1	<0.01	<0.02
Fuel Farm	**MW236**	**19 Jan 2018**	**0089_MW236_S_180119**	**Normal**	**205805**	1.6	3.9	28	0.32	17	<0.02	0.37	0.40	4.1	1.7	*1.4*	2.5	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	0.028	<0.01	<0.01	<0.1	<0.05	<0.02
Fuel Farm	**MW236**	**02 Apr 2020**	**0089_MW236_200402**	**Normal**	**EP2003472**	0.15	0.42	19.8	0.50	67.7	<0.02	<0.1	0.19	0.82	0.42	*1.73*	3.16	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**16 Jul 2020**	**0089_MW236_200716**	**Normal**	**EP2007438**	0.16	0.64	19.8	0.86	55.2	<0.02	<0.1	0.16	0.90	0.38	*1.46*	3.24	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**16 Jul 2020**	**0089_QC108_200716**	**Field Duplicate**	**EP2007438**	0.18	0.73	20.9	0.90	62.0	<0.02	<0.1	0.17	0.99	0.41	*1.62*	3.42	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**20 Jul 2020**	**0089_QC208_200716**	**Interlab Duplicate**	**733018**	0.13	0.34	16	0.32	59	<0.01	0.08	0.14	0.79	0.31	*1.2*	3.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Fuel Farm	**MW236**	**21 Sep 2020**	**0089_MW236_200921**	**Normal**	**EP2010077**	0.33	1.53	23.2	1.09	60.6	<0.02	<0.1	0.20	1.39	0.48	*1.44*	2.79	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**15 Dec 2020**	**0089_MW236_201215**	**Normal**	**EP2014041**	0.30	0.63	14.9	0.37	42.6	<0.02	<0.1	0.16	0.93	0.38	*1.06*	2.08	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**16 Mar 2021**	**0089_MW236_210316**	**Normal**	**EP2102833**	0.45	1.28	17.8	0.66	53.4	<0.02	0.1	0.25	1.72	0.50	*1.24*	3.15	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**10 Jun 2021**	**0089_MW236_210610**	**Normal**	**EP2106579**	0.18	0.36	11.3	0.50	42.2	<0.02	<0.1	0.12	0.78	0.25	*1.27*	1.98	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**31 Aug 2021**	**0089_MW236_210831**	**Normal**	**EP2110073**	0.46	2.64	34.8	0.49	26.0	<0.02	0.1	0.22	1.67	0.90	*1.74*	2.09	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**10 Jan 2022**	**0089_MW236_220110**	**Normal**	**EP2200211**	0.33	1.43	34.6	0.76	49.9	<0.02	0.1	0.21	1.93	0.84	*2.41*	3.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**07 Jun 2022**	**0089_MW236_220607**	**Normal**	**EP2206880**	0.08	0.34	18.1	0.95	84.7	<0.02	<0.1	0.11	0.67	0.36	*1.68*	4.88	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**06 Sep 2022**	**0089_MW236_220906**	**Normal**	**EP2211390**	0.39	1.17	48.1	0.49	68.9	<0.02	0.1	0.21	1.35	0.87	*1.70*	3.35	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**13 Dec 2022**	**0089_MW236_221213**	**Normal**	**EP2216932**	0.22	0.66	27.7	0.46	60.5	<0.02	<0.1	0.15	0.97	0.54	*1.46*	2.68	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**06 Jun 2023**	**0089_MW236_230606**	**Normal**	**EP2307433**	0.16	0.21	17.0	0.63	52.3	<0.02	<0.1	0.12	0.60	0.27	*1.99*	2.91	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fuel Farm	**MW236**	**05 Sep 2023**	**0089_MW236_230905**	**Normal**	**EP2312187**	0.19	0.37	14.1	0.57	53.6	<0.02	<0.1	0.11	0.67	0.24	*1.45*	2.52	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**04 Aug 2017**	**0089_MW238_S_170804**	**Normal**	**199095**	0.002	0.002	0.008	<0.001	0.005	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW238**	**13 Sep 2017**	**0089_MW238_S_170913**	**Normal**	**175739**	0.001	0.002	0.022	<0.001	0.008	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW238**	**13 Sep 2017**	**0089_QC1MW_170913**	**Field Duplicate**	**175739**	0.002	0.002	0.008	<0.001	0.01	<0.002	0.002	<0.002	0.002	<0.001	0.001	0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW238**	**13 Sep 2017**	**0089_QC2MW_170913**	**Interlab Duplicate**	**565731**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
AVCAT Storage	**MW238**	**20 Oct 2017**	**0089_MW238_S_171020**	**Normal**	**178263**	0.001	0.001	0.004	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW238**	**21 Nov 2017**	**0089_MW238_S_171121**	**Normal**	**203587**	0.002	<0.001	0.004	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW238**	**05 Dec 2017**	**0089_MW238_S_171205**	**Normal**	**204183**	0.001	<0.001	0.005	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002
AVCAT Storage	**MW238**	**19 Jan 2018**	**0089_MW238_S_180119**	**Normal**	**205805**	0.002	0.001	0.006	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW238**	**14 Jan 2020**	**0089_MW238_200114**	**Normal**	**EP2000432**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	0.20	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**01 Apr 2020**	**0089_MW238_200401**	**Normal**	**EP2003438**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**16 Jul 2020**	**0089_MW238_200716**	**Normal**	**EP2007438**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**21 Sep 2020**	**0089_MW238_200921**	**Normal**	**EP2010077**	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**30 Sep 2020**	**0089_MW238_200930**	**Normal**	**EP2010524**																									
AVCAT Storage	**MW238**	**15 Dec 2020**	**0089_MW238_201215**	**Normal**	**EP2014041**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**15 Dec 2020**	**0089_QC114_201215**	**Field Duplicate**	**EP2014041**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**15 Dec 2020**	**0089_QC214_201115**	**Interlab Duplicate**	**765054**	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
AVCAT Storage	**MW238**	**15 Feb 2021**	**0089_MW238_210215**	**Normal**	**EP2101486**																									
AVCAT Storage	**MW238**	**18 Mar 2021**	**0089_MW238_210318**	**Normal**	**EP2102955**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**10 Jun 2021**	**0089_MW238_210610**	**Normal**	**EP2106580**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**31 Aug 2021**	**0089_MW238_210831**	**Normal**	**EP2110073**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**12 Jan 2022**	**0089_MW238_220112**	**Normal**	**EP2200288**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**18 Mar 2022**	**0089_MW238_220318**	**Normal**	**EP2203194**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**09 Jun 2022**	**0089_MW238_220609**	**Normal**	**EP2207028**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**06 Sep 2022**	**0089_MW238_220906**	**Normal**	**EP2211389**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**13 Dec 2022**	**0089_MW238_221213**	**Normal**	**EP2216932**	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**15 Mar 2023**	**0089_MW238_230315**	**Normal**	**EP2303198**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**07 Jun 2023**	**0089_MW238_230607**	**Normal**	**EP2307500**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW238**	**05 Sep 2023**	**0089_MW238_230905**	**Normal**	**EP2312177**	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**04 Aug 2017**	**0089_MW239_S_170804**	**Normal**	**199095**	0.001	<0.001	0.008	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW239**	**22 Jul 2020**	**0089_MW239_200722**	**Normal**	**EP2007648**	0.03	0.04	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**21 Sep 2020**	**0089_MW239_200921**	**Normal**	**EP2010077**	0.06	0.08	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**15 Dec 2020**	**0089_MW239_201215**	**Normal**	**EP2014041**	0.03	0.05	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**18 Mar 2021**	**0089_MW239_210318**	**Normal**	**EP2102954**	0.04	0.07	0.04	<0.02	<0.01	<0.02	<0.1	0.02	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**10 Jun 2021**	**0089_MW239_210610**	**Normal**	**EP2106579**	0.03	0.07	0.03	<0.02	0.01	<0.02	<0.1	<0.02	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**31 Aug 2021**	**0089_MW239_210831**	**Normal**	**EP2110073**	<0.02	0.03	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**12 Jan 2022**	**0089_MW239_220112**	**Normal**	**EP2200288**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**18 Mar 2022**	**0089_MW239_220318**	**Normal**	**EP2203194**	<0.02	0.03	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**09 Jun 2022**	**0089_MW239_220609**	**Normal**	**EP2207028**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**06 Sep 2022**	**0089_MW239_220906**	**Normal**	**EP2211389**	<0.02	<0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**13 Dec 2022**	**0089_MW239_221213**	**Normal**	**EP2216932**	<0.02	0.09	0.09	<0.02	0.24	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**15 Mar 2023**	**0089_MW239_230315**	**Normal**	**EP2303198**	<0.02	0.11	0.11	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**07 Jun 2023**	**0089_MW239_230607**	**Normal**	**EP2307500**	<0.02	<0.02	0.15	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW239**	**05 Sep 2023**	**0089_MW239_230905**	**Normal**	**EP2312177**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW240**	**04 Aug 2017**	**0089_MW240_S_170804**	**Normal**	**199095**	0.014	0.051	3.5	0.006	0.002	<0.002	0

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																									
AVCAT Storage	**MW240**	**07 Jun 2023**	**0089_MW240_230607**	**Normal**	**EP2307500**	<0.02	0.03	0.57	<0.02	<0.01	<0.02	<0.1	<0.02	0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW240**	**05 Sep 2023**	**0089_MW240_230905**	**Normal**	**EP2312187**	<0.02	0.06	2.59	0.02	0.01	<0.02	<0.1	<0.02	0.10	0.03	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**07 Aug 2017**	**0089_MW242_S_170807**	**Normal**	**199149**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW242**	**08 Jan 2020**	**0089_MW242_200108**	**Normal**	**EP2000182**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**30 Mar 2020**	**0089_MW242_200330**	**Normal**	**EP2003313**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**16 Jul 2020**	**0089_MW242_200716**	**Normal**	**EP2007438**	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**21 Sep 2020**	**0089_MW242_200921**	**Normal**	**EP2010077**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**15 Dec 2020**	**0089_MW242_201215**	**Normal**	**EP2014041**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**18 Mar 2021**	**0089_MW242_210318**	**Normal**	**EP2102954**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**09 Jun 2021**	**0089_MW242_210609**	**Normal**	**EP2106516**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**31 Aug 2021**	**0089_MW242_210831**	**Normal**	**EP2110073**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**12 Jan 2022**	**0089_MW242_220112**	**Normal**	**EP2200288**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**17 Mar 2022**	**0089_MW242_220317**	**Normal**	**EP2203138**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**08 Jun 2022**	**0089_MW242_220608**	**Normal**	**EP2206969**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**06 Sep 2022**	**0089_MW242_220906**	**Normal**	**EP2211389**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**13 Dec 2022**	**0089_MW242_221213**	**Normal**	**EP2216932**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**15 Mar 2023**	**0089_MW242_230315**	**Normal**	**EP2303198**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**06 Jun 2023**	**0089_MW242_230606**	**Normal**	**EP2307463**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW242**	**04 Sep 2023**	**0089_MW242_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**04 Aug 2017**	**0089_MW243_S_170804**	**Normal**	**199095**	0.003	0.004	0.045	0.012	0.16	<0.002	0.008	0.003	0.009	0.002	0.018	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW243**	**13 Sep 2017**	**0089_MW243_S_170913**	**Normal**	**175739**	0.002	<0.001	0.029	0.004	0.047	<0.002	0.002	<0.002	0.003	<0.001	0.006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW243**	**20 Oct 2017**	**0089_MW243_S_171020**	**Normal**	**178263**	0.002	0.002	0.016	0.001	0.021	<0.002	<0.002	<0.002	0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
AVCAT Storage	**MW243**	**21 Nov 2017**	**0089_MW243_S_171121**	**Normal**	**203587**	0.001	<0.001	0.006	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW243**	**05 Dec 2017**	**0089_MW243_S_171205**	**Normal**	**204183**	0.001	<0.001	0.005	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002
AVCAT Storage	**MW243**	**19 Jan 2018**	**0089_MW243_S_180119**	**Normal**	**205805**	0.001	0.002	0.044	0.027	0.83	<0.002	0.01	0.003	0.005	<0.001	0.008	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW243**	**14 Jan 2020**	**0089_MW243_200114**	**Normal**	**EP2000432**	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.09	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**01 Apr 2020**	**0089_MW243_200401**	**Normal**	**EP2003438**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**16 Jul 2020**	**0089_MW243_200716**	**Normal**	**EP2007438**	<0.02	<0.02	0.03	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**21 Sep 2020**	**0089_MW243_200921**	**Normal**	**EP2010077**	<0.02	<0.02	0.04	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**15 Dec 2020**	**0089_MW243_201215**	**Normal**	**EP2014041**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**18 Mar 2021**	**0089_MW243_210318**	**Normal**	**EP2102955**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**10 Jun 2021**	**0089_MW243_210610**	**Normal**	**EP2106579**	<0.02	<0.02	0.07	<0.02	0.70	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**31 Aug 2021**	**0089_MW243_210831**	**Normal**	**EP2110073**	<0.02	<0.02	0.10	<0.02	0.43	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**12 Jan 2022**	**0089_MW243_220112**	**Normal**	**EP2200288**	<0.02	<0.02	0.07	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**18 Mar 2022**	**0089_MW243_220318**	**Normal**	**EP2203194**	<0.02	<0.02	0.04	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**09 Jun 2022**	**0089_MW243_220609**	**Normal**	**EP2207028**	<0.02	<0.02	0.03	<0.02	0.24	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**06 Sep 2022**	**0089_MW243_220906**	**Normal**	**EP2211389**	<0.02	<0.02	0.11	<0.02	0.16	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**13 Dec 2022**	**0089_MW243_221213**	**Normal**	**EP2216932**	<0.02	<0.02	0.07	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**15 Mar 2023**	**0089_MW243_230315**	**Normal**	**EP2303198**	<0.02	<0.02	0.09	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**07 Jun 2023**	**0089_MW243_230607**	**Normal**	**EP2307500**	<0.02	<0.02	0.06	<0.02	0.12	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW243**	**05 Sep 2023**	**0089_MW243_230905**	**Normal**	**EP2312177**	<0.02	<0.02	0.07	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**04 Aug 2017**	**0089_MW245_S_170804**	**Normal**	**199095**	<0.001	<0.001	0.19	0.017	0.62	<0.002	0.96	<0.002	0.033	<0.001	0.022	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW245**	**13 Sep 2017**	**0089_MW245_S_170913**	**Normal**	**175739**	0.002	0.005	0.039	0.003	0.31	<0.002	<0.002	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW245**	**20 Oct 2017**	**0089_MW245_S_171020**	**Normal**	**178263**	<0.010	<0.010	0.14	0.006	0.55	<0.020	<0.020	<0.020	0.015	<0.010	<0.010	<0.010	<0.020	<0.020	<0.050	<0.10	<0.50	<0.010	0.001	<0.010	<0.010	<0.10	<0.05	<0.020
AVCAT Storage	**MW245**	**21 Nov 2017**	**0089_MW245_S_171121**	**Normal**	**203587**	0.011	0.027	0.20	0.007	0.40	<0.002	0.22	<0.002	0.010	0.001	0.009	0.001	0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW245**	**05 Dec 2017**	**0089_MW245_S_171205**	**Normal**	**204183**	<0.005	0.080	0.14	0.008	0.37	<0.002	<0.01	<0.01	0.041	<0.001	0.007	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.005	0.020	<0.001	<0.001	<0.01	<0.01	<0.002
AVCAT Storage	**MW245**	**19 Jan 2018**	**0089_MW245_S_180119**	**Normal**	**205805**	0.005	0.007	0.078	0.004	0.22	<0.002	<0.02	<0.002	0.031	0.004	0.006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW245**	**14 Jan 2020**	**0089_MW245_200114**	**Normal**	**EP2000432**	<0.02	<0.02	<0.02	<0.02	0.35	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**01 Apr 2020**	**0089_MW245_200401**	**Normal**	**EP2003438**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**16 Jul 2020**	**0089_MW245_200716**	**Normal**	**EP2007438**	<0.02	<0.02	0.16	<0.02	0.18	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**21 Sep 2020**	**0089_MW245_200921**	**Normal**	**EP2010077**	<0.02	<0.02	0.12	<0.02	0.20	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**15 Dec 2020**	**0089_MW245_201215**	**Normal**	**EP2014041**	<0.02	<0.02	0.03	<0.02	0.15	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**18 Mar 2021**	**0089_MW245_210318**	**Normal**	**EP2102955**	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**10 Jun 2021**	**0089_MW245_210610**	**Normal**	**EP2106579**	<0.02	<0.02	0.05	<0.02	0.14	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**31 Aug 2021**	**0089_MW245_210831**	**Normal**	**EP2110073**	<0.02	<0.02	0.03	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**12 Jan 2022**	**0089_MW245_220112**	**Normal**	**EP2200288**	<0.02	<0.02	<0.01	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**18 Mar 2022**	**0089_MW245_220318**	**Normal**	**EP2203194**	<0.02	<0.02	0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**09 Jun 2022**	**0089_MW245_220609**	**Normal**	**EP2207028**	<0.02	<0.02	0.04	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**06 Sep 2022**	**0089_MW245_220906**	**Normal**	**EP2211389**	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**13 Dec 2022**	**0089_MW245_221213**	**Normal**	**EP2216932**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**15 Mar 2023**	**0089_MW245_230315**	**Normal**	**EP2303198**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**07 Jun 2023**	**0089_MW245_230607**	**Normal**	**EP2307500**	<0.02	<0.02	0.03	<0.02	0.02	<0.02	<0.3	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW245**	**05 Sep 2023**	**0089_MW245_230905**	**Normal**	**EP2312177**	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW249**	**07 Aug 2017**	**0089_MW249_S_170807**	**Normal**	**199149**	0.014	0.065	1.8	0.012	0.45	<0.002	<0.002	<0.002	0.15	0.017	0.079	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW249**	**13 Sep 2017**	**0089_MW249_S_170913**	**Normal**	**175739**	0.015	0.052	1.7	0.014	0.57	<0.002	0.004	0.008	0.14	0.024	0.052	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW249**	**20 Oct 2017**	**0089_MW249_S_171020**	**Normal**	**178263**	0.012	0.060	1.4	0.044	0.57	<0.002	0.004	0.01	0.13	0.014	0.083	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.004	0.004	<0.001	<0.01	<0.05	<0.002
AVCAT Storage	**MW249**	**21 Nov 2017**	**0089_MW249_S_171121**	**Normal**	**203587**	0.010	0.040	1.4	0.021	0.39	<0.002	0.003	0.007	0.10	0.011	0.060	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW249**	**05 Dec 2017**	**0089_MW249_S_171205**	**Normal**	**204183**	0.012	0.042	1.4	0.021	0.50	<0.002	0.004	0.009	0.13	0.010	0.069	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002
AVCAT Storage	**MW249**	**19 Jan 2018**	**0089_MW249_S_180119**	**Normal**	**205805**	0.007	0.030	0.60	0.020	0.21	<0.002	<0.002	0.004	0.061	0.005	0.026	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
AVCAT Storage	**MW249**	**08 Jan 2020**	**0089_MW249_200108**	**Normal**	**EP2000182**	<0.02	<0.02	0.28	<0.02	0.16	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW249**	**30 Mar 2020**	**0089_MW249_200330**	**Normal**	**EP2003313**	<0.02	<0.02	0.12	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW249**	**16 Jul 2020**	**0089_MW249_200716**	**Normal**	**EP2007438**	<0.02	<0.02	0.07	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW249**	**16 Jul 2020**	**0089_QC110_200716**	**Field Duplicate**	**EP2007438**	<0.02	<0.02	0.09	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW249**	**20 Jul 2020**	**0089_QC210_200716**	**Interlab Duplicate**	**733018**

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																									
Fire Station	**MW255**	**13 Sep 2017**	**0089_MW255_S_170913**	**Normal**	**175739**	1.6	1.4	0.85	0.015	1.2	<0.002	0.27	0.17	1.7	0.097	0.039	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Fire Station	**MW255**	**20 Oct 2017**	**0089_MW255_S_171020**	**Normal**	**178263**	1.6	1.0	0.60	0.016	1.0	<0.002	0.34	0.74	2.6	0.093	0.045	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002
Fire Station	**MW255**	**21 Nov 2017**	**0089_MW255_S_171121**	**Normal**	**203587**	2.5	1.5	0.70	0.019	0.76	<0.002	0.46	0.84	3.7	0.086	0.036	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.002
Fire Station	**MW255**	**08 Dec 2017**	**0089_MW255_S_171208**	**Normal**	**204353**	2.4	1.9	0.64	0.014	1.3	<0.002	0.46	0.70	4.2	0.098	0.044	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.004	<0.001	<0.001	<0.01	<0.005	<0.002
Fire Station	**MW255**	**19 Jan 2018**	**0089_MW255_S_180119**	**Normal**	**205805**	2.1	1.2	0.71	0.020	0.90	<0.002	0.40	0.63	4.0	0.11	0.043	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Fire Station	**MW255**	**16 Jul 2020**	**0089_MW255_200716**	**Normal**	**EP2007438**	0.09	0.19	1.26	<0.02	0.78	<0.02	<0.1	0.07	0.30	0.06	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**16 Jul 2020**	**0089_QC109_200716**	**Field Duplicate**	**EP2007438**	0.09	0.21	1.40	<0.02	1.07	<0.02	<0.1	0.07	0.33	0.07	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**20 Jul 2020**	**0089_QC209_200716**	**Interlab Duplicate**	**733018**	0.08	0.15	1.3	0.03	0.69	0.02	0.05	0.11	0.27	0.07	0.04	<0.01	0.01	0.02	<0.01	<0.01	0.01	0.01	<0.05	<0.01	0.02	<0.05	<0.05	<0.05
Fire Station	**MW255**	**22 Sep 2020**	**0089_MW255_200922**	**Normal**	**EP2010141**	0.45	1.54	14.2	0.05	1.13	<0.02	0.1	0.24	1.55	0.63	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**22 Sep 2020**	**0089_QC114_200922**	**Field Duplicate**	**EP2010141**	0.52	1.20	14.0	0.05	1.57	<0.02	0.2	0.31	1.66	0.62	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**22 Sep 2020**	**0089_QC214_200921**	**Interlab Duplicate**	**746269**	0.28	0.79	9.7	0.03	0.89	<0.01	0.12	0.18	0.99	0.42	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Fire Station	**MW255**	**16 Dec 2020**	**0089_MW255_201216**	**Normal**	**EP2014106**	0.10	0.22	2.44	<0.02	0.94	<0.02	<0.1	0.07	0.31	0.12	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**17 Mar 2021**	**0089_MW255_210317**	**Normal**	**EP2102900**	0.10	0.07	1.05	<0.02	0.65	<0.02	<0.1	0.04	0.19	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**10 Jun 2021**	**0089_MW255_210610**	**Normal**	**EP2106580**	0.07	0.08	1.15	<0.02	0.53	<0.02	<0.1	0.04	0.17	0.04	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**31 Aug 2021**	**0089_MW255_210831**	**Normal**	**EP2110073**	0.12	0.47	6.89	0.02	0.90	<0.02	<0.1	0.08	0.44	0.19	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**10 Jan 2022**	**0089_MW255_220110**	**Normal**	**EP2200211**	0.06	0.04	0.66	<0.02	0.40	<0.02	<0.1	0.02	0.11	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**17 Mar 2022**	**0089_MW255_220317**	**Normal**	**EP2203138**	0.11	0.06	0.55	<0.02	0.32	<0.02	<0.1	0.04	0.23	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**09 Jun 2022**	**0089_MW255_220609**	**Normal**	**EP2207028**	<0.05	0.09	1.40	<0.02	0.14	<0.02	<0.1	<0.05	0.10	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**06 Sep 2022**	**0089_MW255_220906**	**Normal**	**EP2211389**	0.13	0.33	0.94	<0.02	0.95	<0.02	<0.1	0.09	0.52	0.19	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**13 Dec 2022**	**0089_MW255_221213**	**Normal**	**EP2216932**	0.23	0.43	10.6	<0.02	0.55	<0.02	<0.1	0.10	0.58	0.18	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**13 Mar 2023**	**0089_MW255_230313**	**Normal**	**EP2303119**	0.44	0.32	5.23	<0.02	0.34	<0.02	0.1	0.21	1.08	0.12	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**06 Jun 2023**	**0089_MW255_230606**	**Normal**	**EP2307433**	0.40	0.47	7.58	<0.02	0.32	<0.02	0.1	0.18	0.95	0.14	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW255**	**05 Sep 2023**	**0089_MW255_230905**	**Normal**	**EP2312187**	0.53	0.48	11.4	0.04	0.65	<0.02	0.2	0.22	1.21	0.30	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Fire Station	**MW256**	**04 Aug 2017**	**0089_MW256_S_170804**	**Normal**	**199095**	0.042	0.043	0.49	0.028	4.8	<0.002	0.049	0.080	0.20	0.063	0.095	0.006	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.008	<0.001	<0.001	0.06	<0.005	<0.002
Fire Station	**MW256**	**13 Sep 2017**	**0089_MW256_S_170913**	**Normal**	**175739**	0.059	0.035	0.49	0.017	4.5	<0.002	0.062	0.077	0.16	0.068	0.093	0.006	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.005	<0.001	<0.001	0.06	<0.005	<0.002
Fire Station	**MW256**	**20 Oct 2017**	**0089_MW256_S_171020**	**Normal**	**178263**	0.067	0.084	0.61	0.061	3.9	<0.002	0.051	0.12	0.26	0.082	0.15	0.01	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.01	0.002	<0.001	0.02	<0.05	<0.002
Fire Station	**MW256**	**21 Nov 2017**	**0089_MW256_S_171121**	**Normal**	**203587**	0.10	0.12	0.87	0.088	2.4	<0.002	0.068	0.20	0.42	0.090	0.16	0.011	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.017	0.001	<0.001	<0.01	<0.005	<0.002
Fire Station	**MW256**	**08 Dec 2017**	**0089_MW256_S_171208**	**Normal**	**204353**	0.10	0.079	1.1	0.063	3.6	<0.002	0.078	0.16	0.53	0.18	0.19	0.010	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.022	<0.001	<0.001	0.07	<0.005	<0.002
Fire Station	**MW256**	**19 Jan 2018**	**0089_MW256_S_180119**	**Normal**	**205805**	0.093	0.20	0.98	0.11	3.0	0.020	0.074	0.12	0.52	0.099	0.18	0.012	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.023	0.001	<0.001	0.07	<0.005	<0.002
Fire Station	**MW256**	**30 Mar 2020**	**0089_MW256_200330**	**Normal**	**EP2003313**	1.08	1.13	9.14	0.44	8.05	<0.02	0.2	0.90	2.82	0.35	*0.67*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.26	<0.05	<0.05	0.08	<0.05	<0.02
Fire Station	**MW256**	**16 Jul 2020**	**0089_MW256_200716**	**Normal**	**EP2007438**	0.60	0.90	4.95	0.22	6.96	0.05	0.1	0.34	1.60	0.19	0.31	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.10	<0.05	<0.05	0.08	<0.05	<0.02
Fire Station	**MW256**	**22 Sep 2020**	**0089_MW256_200922**	**Normal**	**EP2010141**	0.48	0.76	7.71	0.68	14.3	0.05	0.2	0.60	2.81	0.26	*0.60*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.40	<0.05	<0.05	0.14	<0.05	<0.02
Fire Station	**MW256**	**14 Dec 2020**	**0089_MW256_201214**	**Normal**	**EP2013975**	0.25	0.30	3.47	0.30	6.33	<0.02	0.1	0.33	1.34	0.11	0.29	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.19	<0.05	<0.05	0.03	<0.05	<0.02
Fire Station	**MW256**	**17 Mar 2021**	**0089_MW256_210317**	**Normal**	**EP2102900**	0.25	0.32	3.65	0.29	6.55	<0.02	<0.1	0.34	1.38	0.12	0.29	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.21	<0.05	<0.05	0.03	<0.05	<0.02
Fire Station	**MW256**	**10 Jun 2021**	**0089_MW256_210610**	**Normal**	**EP2106579**	1.28	3.05	38.8	2.11	36.2	<0.02	0.3	0.67	3.96	0.70	*2.34*	0.10	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.14	<0.05	<0.05	0.08	<0.05	<0.02
Fire Station	**MW256**	**10 Jun 2021**	**0089_QC113_210610**	**Field Duplicate**	**EP2106579**	1.40	2.68	34.4	1.88	30.6	<0.02	0.3	0.70	4.21	0.76	*2.45*	0.10	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.13	<0.05	<0.05	0.07	<0.05	<0.02
Fire Station	**MW256**	**10 Jun 2021**	**0089_QC213_210610**	**Interlab Duplicate**	**802734**	1.8	3.0	27	2.4	29	<0.01	0.41	0.67	3.9	0.77	*2.3*	0.11	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	<0.01	<0.01	0.19	<0.05	<0.05
Fire Station	**MW256**	**31 Aug 2021**	**0089_MW256_210831**	**Normal**	**EP2110064**	1.67	0.83	6.42	0.26	12.0	<0.02	0.6	0.78	2.34	0.19	0.45	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.25	<0.05	<0.05	0.07	<0.05	<0.02
Fire Station	**MW256**	**10 Jan 2022**	**0089_MW256_220110**	**Normal**	**EP2200211**	0.67	0.57	4.99	0.32	8.18	<0.02	0.4	0.67	3.02	0.20	0.39	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.44	<0.05	<0.05	0.07	<0.05	<0.02
Fire Station	**MW256**	**10 Jan 2022**	**0089_QC110_220110**	**Field Duplicate**	**EP2200211**	0.62	0.54	4.67	0.32	7.68	<0.02	0.4	0.63	2.79	0.19	0.37	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.44	<0.05	<0.05	0.06	<0.05	<0.02
Fire Station	**MW256**	**10 Jan 2022**	**0089_QC210_220110**	**Interlab Duplicate**	**854607**	0.42	0.46	3.4	0.24	8.6	<0.01	0.34	0.47	1.5	0.13	0.34	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.32	<0.01	<0.01	0.06	<0.05	<0.05
Fire Station	**MW256**	**17 Mar 2022**	**0089_MW256_220317**	**Normal**	**EP2203138**	3.22	1.54	10.7	0.55	10.7	0.02	1.1	1.47	5.22	0.41	*0.72*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.23	<0.05	<0.05	0.08	<0.05	<0.02
Fire Station	**MW256**	**09 Jun 2022**	**0089_MW256_220609**	**Normal**	**EP2207028**	0.51	0.44	3.12	0.39	10.7	<0.02	0.2	0.40	1.32	0.16	0.42	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.16	<0.05	<0.05	0.08	<0.05	<0.02
Fire Station	**MW256**	**06 Sep 2022**	**0089_MW256_220906**	**Normal**	**EP2211389**	0.93	0.41	3.32	0.15	9.10	<0.02	0.6	0.59	1.19	0.11	0.19	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.02
Fire Station	**MW256**	**13 Dec 2022**	**0089_MW256_221213**	**Normal**	**EP2216932**	1.56	0.61	3.36	0.11	3.59	<0.02	0.6	0.97	1.86	0.14	0.18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.12	<0.05	<0.05	0.04	<0.05	<0.02
Fire Station	**MW256**	**13 Mar 2023**	**0089_MW256_230313**	**Normal**	**EP2303119**	1.51	0.93	6.48	0.18	5.19	<0.02	0.6	0.86	3.40	0.27	0.36	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.15	<0.05	<0.05	0.05	<0.05	<0.02
Fire Station	**MW256**	**06 Jun 2023**	**0089_MW256_230606**	**Normal**	**EP2307433**	0.77	0.76	8.00	0.35	11.2	<0.02	0.3	0.45	1.73	0.19	*0.67*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.13	<0.05	<0.05	0.08	<0.05	<0.02
Fire Station	**MW256**	**05 Sep 2023**	**0089_MW256_230905**	**Normal**	**EP2312187**	2.11	1.67	6.35	0.26	5.69	<0.02	0.5	0.72	3.60	0.27	0.31	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.21	<0.05	<0.05	0.02	<0.05	<0.02
	MW257	**04 Aug 2017**	**0089_MW257_S_170804**	**Normal**	**199095**	<0.001	<0.001	0.005	<0.001	0.015	<0.002	0.003	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
	MW257	**13 Sep 2017**	**0089_MW257_S_170913**	**Normal**	**175739**	0.002	<0.001	0.01	<0.001	0.038	<0.002	0.006	0.004	0.004	0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
	MW257	**20 Oct 2017**	**0089_MW257_S_171020**	**Normal**	**178263**	0.003	0.002	0.013	<0.001	0.050	<0.002	0.007	0.005	0.006	<0.001	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
	MW257	**21 Nov 2017**	**0089_MW257_S_171121**	**Normal**	**203587**	0.014	0.006	0.076	0.007	0.30	<0.002	0.020	0.026	0.040	0.006	0.005	0.002	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
	MW257	**08 Dec 2017**	**0089_MW257_S_171208**	**Normal**	**204353**	0.006	0.003	0.029	<0.001	0.19	<0.002	0.01	0.01	0.020	0.002	0.003	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002
	MW257	**19 Jan 2018**	**0089_MW257_S_180119**	**Normal**	**205805**	0.003	<0.001	0.011	<0.001	0.008	<0.002	0.008	0.002	0.004	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.004	<0.001	<0.001	<0.01	<0.005	<0.002
	MW257	**19 Dec 2019**	**0089_MW257_191219**	**Normal**	**EP1913598**	<0.02	<0.02	0.05	<0.02	0.04	<0.02	<0.1	0.02	0.02	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**02 Apr 2020**	**0089_MW257_200402**	**Normal**	**EP2003472**	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**16 Jul 2020**	**0089_MW257_200716**	**Normal**	**EP2007438**	<0.02	<0.02	0.02	0.03	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**22 Sep 2020**	**0089_MW257_200922**	**Normal**	**EP2010141**	<0.02	<0.02	0.53	0.15	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Flammable / hazardous goods and waste storage area	**MW257**	**16 Dec 2020**	**0089_MW257_201216**	**Normal**	**EP2014106**	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**18 Mar 2021**	**0089_MW257_210318**	**Normal**	**EP2102954**	<0.02	<0.02	0.06	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**09 Jun 2021**	**0089_MW257_210609**	**Normal**	**EP2106516**	<0.02	<0.02	0.03	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**31 Aug 2021**	**0089_MW257_210831**	**Normal**	**EP2110073**	<0.02	0.03	0.90	0.10	0.08	<0.02	<0.1	0.03	0.06	0.02	0.12	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**10 Jan 2022**	**0089_MW257_220110**	**Normal**	**EP2200211**	<0.02	<0.02	0.03	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**17 Mar 2022**	**0089_MW257_220317**	**Normal**	**EP2203138**	<0.02	<0.02	0.06	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**09 Jun 2022**	**0089_MW257_220609**	**Normal**	**EP2207028**	<0.02	<0.02	<0.05	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**06 Sep 2022**	**0089_MW257_220906**	**Normal**	**EP2211389**	<0.02	<0.02	0.16	<0.02	0.20	<0.02	<0.1	0.04	0.05	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**13 Dec 2022**	**0089_MW257_221213**	**Normal**	**EP2216932**	<0.02	<0.02	0.35	<0.02	0.03	<0.02	<0.1	0.12	0.09	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**13 Mar 2023**	**0089_MW257_230313**	**Normal**	**EP2303119**	<0.02	<0.02	1.10	<0.02	0.04	<0.02	<0.1	0.15	0.12	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**06 Jun 2023**	**0089_MW257_230606**	**Normal**	**EP2307433**	<0.02	<0.02	0.38	<0.02	0.10	<0.02	<0.1	0.11	0.06	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW257	**05 Sep 2023**	**0089_MW257_230905**	**Normal**	**EP2312187**	<0.02	<0.02	0.16	<0.02	0.36	<0.02	<0.1	0.11	0.08	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW258	**04 Aug 2017**	**0089_MW258_S_170804**	**Normal**	**199095**	2.8	2.0	10	0.44	5.2	<0.002	0.63	1.2	3.4	0.39	0.52	0.002	<0.002	<0.002	<0.005	<0.01	<0.05	0.001	0.15	<0.001	<0.001	<0.01	<0.005	<0.002
	MW258	**13 Sep 2017**	**0089_MW258_S_170913**	**Normal**	**175739**	4.0	3.0	11	0.79	6.5	<0.002	0.94	0.50	3.2	0.27	0.42	0.003	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.18	<0.001	<0.001	<0.01	<0.005	<0.002
	MW258	**20 Oct 2017**	**0089_MW258_S_171020**	**Normal**	**178263**	3.1	2.4	10	0.42	5.3	<0.02	0.58	1.3	3.7	0.37	0.53	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	0.15	<0.01	<0.01	<0.1	<0.05	<0.02
	MW258	**21 Nov 2017**	**0089_MW258_S_171121**	**Normal**	**203587**	4.4	2.8	9.8	0.58	5.8	<0.002	0.76	1.3	4.4	0.38	0.49	0.003	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.10	<0.001	<0.001	<0.01	<0.005	<0.002
Flammable / hazardous goods and waste storage area	**MW258**	**08 Dec 2017**	**0089_MW258_S_171208**	**Normal**	**204353**	3.6	2.4	11	0.54	10	<0.002	0.66	1.1	4.6	0.34	0.47	0.002	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.18	<0.001	<0.001	<0.01	<0.005	<0.002
	MW258	**19 Jan 2018**	**0089_MW258

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																									
Flammable / hazardous goods and waste storage area	**MW259**	**10 Jun 2021**	**0089_MW259_210610**	**Normal**	**EP2106580**	<0.02	0.04	0.13	<0.02	0.41	<0.02	<0.1	0.09	0.16	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW259	**31 Aug 2021**	**0089_MW259_210831**	**Normal**	**EP2110073**	<0.02	<0.02	0.02	<0.02	0.12	<0.02	<0.1	0.08	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW259	**11 Jan 2022**	**0089_MW259_220111**	**Normal**	**EP2200241**	<0.02	<0.02	<0.01	<0.02	0.13	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW259	**17 Mar 2022**	**0089_MW259_220317**	**Normal**	**EP2203138**	0.02	0.02	0.08	<0.02	0.18	<0.02	0.1	0.54	0.44	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW259	**09 Jun 2022**	**0089_MW259_220609**	**Normal**	**EP2207028**	<0.02	<0.05	<0.05	<0.02	0.11	<0.02	<0.2	0.16	0.09	<0.05	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW259	**06 Sep 2022**	**0089_MW259_220906**	**Normal**	**EP2211389**	0.03	0.08	0.22	<0.02	0.18	<0.02	<0.1	0.13	0.17	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW259	**13 Dec 2022**	**0089_MW259_221213**	**Normal**	**EP2216932**	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.1	0.06	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW259	**13 Mar 2023**	**0089_MW259_230313**	**Normal**	**EP2303119**	<0.02	<0.02	0.03	<0.02	0.12	<0.02	<0.1	0.14	0.11	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW259	**06 Jun 2023**	**0089_MW259_230606**	**Normal**	**EP2307433**	<0.02	<0.02	0.10	<0.02	0.14	<0.02	<0.1	0.14	0.11	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW259	**06 Jun 2023**	**0089_QC102_230606**	**Field Duplicate**	**EP2307433**	<0.02	<0.02	0.11	<0.02	0.16	<0.02	<0.1	0.14	0.10	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW259	**06 Jun 2023**	**0089_QC202_230606**	**Interlab Duplicate**	**997465**	<0.01	0.01	0.11	<0.01	0.06	<0.01	<0.05	0.13	0.08	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
	MW259	**05 Sep 2023**	**0089_MW259_230905**	**Normal**	**EP2312187**	<0.02	<0.02	0.09	<0.02	0.08	<0.02	<0.1	0.12	0.09	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW259	**05 Sep 2023**	**0089_QC117_230905**	**Field Duplicate**	**EP2312187**	<0.02	<0.02	0.10	<0.02	0.09	<0.02	<0.1	0.14	0.09	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
	MW259	**05 Sep 2023**	**0089_QC217_230905**	**Interlab Duplicate**	**1023399**	0.01	0.01	0.09	<0.01	0.09	<0.01	<0.05	0.13	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Dredge Spoil	**MW268**	**01 Aug 2017**	**0089_MW268_S_170801**	**Normal**	**198918**	0.094	0.11	0.35	<0.001	<0.001	<0.002	0.005	<0.002	0.052	0.003	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Dredge Spoil	**MW268**	**19 Sep 2017**	**0089_MW268_S_170919**	**Normal**	**176140**	0.085	0.11	0.44	<0.001	0.005	<0.002	0.008	0.003	0.051	0.005	0.003	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Dredge Spoil	**MW268**	**16 Oct 2017**	**0089_MW268_S_171016**	**Normal**	**177956**	0.085	0.11	0.40	<0.001	0.002	<0.002	0.008	0.003	0.046	0.003	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Dredge Spoil	**MW268**	**17 Nov 2017**	**0089_MW268_S_171117**	**Normal**	**203443**	0.094	0.13	0.41	<0.001	0.002	<0.002	0.009	0.003	0.060	0.004	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.004	<0.001	<0.001	<0.01	<0.05	<0.002
Dredge Spoil	**MW268**	**07 Dec 2017**	**0089_MW268_S_171207**	**Normal**	**204323**	0.13	0.18	0.40	<0.001	0.031	<0.002	0.01	0.004	0.054	0.002	0.003	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Dredge Spoil	**MW268**	**16 Jan 2018**	**0089_MW268_S_180116**	**Normal**	**205631**	0.080	0.13	0.40	0.002	<0.001	<0.002	0.009	0.004	0.068	0.004	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Dredge Spoil	**MW268**	**19 Dec 2019**	**0089_MW268_191219**	**Normal**	**EP1913595**	0.10	0.12	0.76	<0.02	0.04	<0.02	<0.1	<0.02	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.14	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**30 Mar 2020**	**0089_MW268_200330**	**Normal**	**EP2003313**	0.08	0.11	0.49	<0.02	<0.01	<0.02	<0.1	<0.02	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**21 Jul 2020**	**0089_MW268_200721**	**Normal**	**EP2007611**	0.07	0.12	0.39	<0.02	<0.01	<0.02	<0.1	<0.02	0.10	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**21 Sep 2020**	**0089_MW268_200921**	**Normal**	**EP2010085**	0.08	0.09	0.37	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**14 Dec 2020**	**0089_MW268_201214**	**Normal**	**EP2013975**	0.03	0.04	0.20	<0.02	<0.01	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**16 Mar 2021**	**0089_MW268_210316**	**Normal**	**EP2102837**	0.05	0.06	0.30	<0.02	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**16 Mar 2021**	**0089_QC116_210316**	**Field Duplicate**	**EP2102837**	0.04	0.05	0.26	<0.02	<0.01	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**16 Mar 2021**	**0089_QC216_210316**	**Interlab Duplicate**	**781350**	0.03	0.05	0.31	<0.01	<0.01	<0.01	<0.05	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Dredge Spoil	**MW268**	**09 Jun 2021**	**0089_MW268_210609**	**Normal**	**EP2106515**	0.05	0.09	0.28	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**31 Aug 2021**	**0089_MW268_210831**	**Normal**	**EP2110073**	0.06	0.09	0.41	<0.02	<0.01	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**11 Jan 2022**	**0089_MW268_220111**	**Normal**	**EP2200241**	0.07	0.07	0.41	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**17 Mar 2022**	**0089_MW268_220317**	**Normal**	**EP2203138**	0.07	0.06	0.33	<0.02	0.02	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**09 Jun 2022**	**0089_MW268_220609**	**Normal**	**EP2207028**	0.05	0.07	0.41	<0.02	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**06 Sep 2022**	**0089_MW268_220906**	**Normal**	**EP2211390**	0.06	0.08	0.58	<0.02	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**13 Dec 2022**	**0089_MW268_221213**	**Normal**	**EP2216933**	0.05	0.05	0.34	<0.02	<0.01	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**15 Mar 2023**	**0089_MW268_230315**	**Normal**	**EP2303198**	0.05	0.05	0.32	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**06 Jun 2023**	**0089_MW268_230606**	**Normal**	**EP2307433**	0.05	0.07	0.32	<0.02	0.01	<0.02	<0.1	0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW268**	**04 Sep 2023**	**0089_MW268_230904**	**Normal**	**EP2312225**	0.09	0.09	0.32	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**01 Aug 2017**	**0089_MW269_S_170801**	**Normal**	**198918**	0.015	0.013	0.094	0.002	0.27	<0.002	0.006	0.01	0.023	0.002	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Dredge Spoil	**MW269**	**19 Sep 2017**	**0089_MW269_S_170919**	**Normal**	**176140**	0.027	0.021	0.30	0.003	0.29	<0.002	0.01	0.020	0.054	0.011	0.006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Dredge Spoil	**MW269**	**16 Oct 2017**	**0089_MW269_S_171016**	**Normal**	**177956**	0.041	0.040	0.34	0.002	0.27	<0.002	0.01	0.022	0.063	0.01	0.009	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Dredge Spoil	**MW269**	**17 Nov 2017**	**0089_MW269_S_171117**	**Normal**	**203443**	0.031	0.042	0.40	0.006	0.27	<0.002	0.01	0.021	0.052	0.006	0.006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Dredge Spoil	**MW269**	**07 Dec 2017**	**0089_MW269_S_171207**	**Normal**	**204323**	0.012	0.009	0.082	0.002	0.18	<0.002	0.006	0.007	0.016	0.002	0.005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Dredge Spoil	**MW269**	**16 Jan 2018**	**0089_MW269_S_180116**	**Normal**	**205631**	0.032	0.034	0.31	0.010	0.24	<0.002	0.01	0.024	0.060	0.007	0.007	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Dredge Spoil	**MW269**	**19 Dec 2019**	**0089_MW269_191219**	**Normal**	**EP1913595**	0.10	0.14	0.53	<0.02	1.03	<0.02	<0.1	0.04	0.20	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.30	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**30 Mar 2020**	**0089_MW269_200330**	**Normal**	**EP2003313**	0.08	0.11	0.44	<0.02	0.67	<0.02	<0.1	0.04	0.14	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**21 Jul 2020**	**0089_MW269_200721**	**Normal**	**EP2007611**	0.05	0.10	0.31	<0.02	0.51	<0.02	<0.1	0.02	0.13	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**21 Sep 2020**	**0089_MW269_200921**	**Normal**	**EP2010085**	0.07	0.10	0.39	<0.02	0.65	<0.02	<0.1	0.02	0.13	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**14 Dec 2020**	**0089_MW269_201214**	**Normal**	**EP2013975**	0.04	0.06	0.30	<0.02	0.35	<0.02	<0.1	0.02	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**16 Mar 2021**	**0089_MW269_210316**	**Normal**	**EP2102837**	0.06	0.10	0.59	<0.02	0.48	<0.02	<0.1	0.03	0.12	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**09 Jun 2021**	**0089_MW269_210609**	**Normal**	**EP2106515**	0.09	0.13	0.60	<0.02	0.45	<0.02	<0.1	0.03	0.13	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**31 Aug 2021**	**0089_MW269_210831**	**Normal**	**EP2110073**	0.07	0.10	0.59	<0.02	0.41	<0.02	<0.1	0.03	0.14	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**11 Jan 2022**	**0089_MW269_220111**	**Normal**	**EP2200241**	0.02	0.04	0.24	0.02	0.22	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**17 Mar 2022**	**0089_MW269_220317**	**Normal**	**EP2203138**	0.06	0.10	0.52	<0.02	0.56	<0.02	<0.1	0.02	0.14	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**09 Jun 2022**	**0089_MW269_220609**	**Normal**	**EP2207028**	0.05	0.09	0.61	<0.02	0.43	<0.02	<0.1	0.02	0.11	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**06 Sep 2022**	**0089_MW269_220906**	**Normal**	**EP2211390**	0.06	0.09	0.63	<0.02	0.51	<0.02	<0.1	0.03	0.12	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**13 Dec 2022**	**0089_MW269_221213**	**Normal**	**EP2216933**	<0.02	<0.02	0.10	<0.02	0.19	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**15 Mar 2023**	**0089_MW269_230315**	**Normal**	**EP2303198**	0.06	0.08	0.33	<0.02	0.34	<0.02	<0.1	0.02	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**06 Jun 2023**	**0089_MW269_230606**	**Normal**	**EP2307433**	0.05	0.07	0.30	<0.02	0.35	<0.02	<0.1	0.02	0.09	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Dredge Spoil	**MW269**	**04 Sep 2023**	**0089_MW269_230904**	**Normal**	**EP2312225**	0.05	0.07	0.31	<0.02	0.31	<0.02	<0.1	<0.02	0.08	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW282**	**11 Sep 2017**	**0089_MW282_S_170911**	**Normal**	**175533**	4.7	6.8	57	15	60	<0.02	1.4	0.78	10	1.0	***13***	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02
HSF	**MW282**	**16 Oct 2017**	**0089_MW282_S_171016**	**Normal**	**177956**	6.0	5.9	58	5.7	75	<0.02	1.3	3.5	14	2.3	***12***	0.020	<0.02	<0.02	<0.1	<0.1	<0.5	<0.01	0.058	<0.01	<0.02	<0.1	<0.05	<0.02
HSF	**MW282**	**17 Nov 2017**	**0089_MW282_S_171117**	**Normal**	**203443**	5.3	6.0	57	5.4	80	<0.02	1.3	3.1	15	2.5	*10*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	0.049	<0.01	<0.01	<0.1	<0.05	<0.02
HSF	**MW282**	**05 Dec 2017**	**0089_MW282_S_171205**	**Normal**	**204183**	8.0	7.4	44	4.3	100	<0.04	1.6	1.7	16	1.3	*7.6*	<0.02	<0.04	<0.04	<0.1	<0.2	<1	<0.02	0.050	<0.02	<0.02	<0.02	<0.1	<0.04
HSF	**MW282**	**15 Jan 2018**	**0089_MW282_S_180115**	**Normal**	**205568**	4.9	7.6	50	4.7	66	<0.002	1.5	2.1	17	2.5	*7.2*	0.024	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.11	<0.001	<0.001	<0.01	<0.005	<0.002
HSF	**MW282**	**19 Dec 2019**	**0089_MW282_191219**	**Normal**	**EP1913595**	7.28	11.7	59.8	6.15	183	<0.02	1.1	2.85	11.8	3.34	*7.70*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW282**	**19 Dec 2019**	**0089_QC101_191219**	**Field Duplicate**	**EP1913595**	6.06	10.3	50.3	5.40	120	<0.02	0.6	2.81	19.7	3.29	*6.92*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.34	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW282**	**31 Mar 2020**	**0089_MW282_200331**	**Normal**	**EP2003366**	5.69	9.88	68.8	6.36	54.2	<0.02	2.2	4.66	21.8	4.43	*8.84*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW282**	**22 Jul 2020**	**0089_MW282_200722**	**Normal**	**EP2007667**	0.67	3.44	43.7	9.06	71.5	<0.02	0.2	0.55	3.83	0.99	***10.1***	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW282**	**24 Sep 2020**	**0089_MW282_200924**	**Normal**	**EP2010273**	0.99	2.61	19.8	6.14	38.8	<0.02	0.4	0.97	5.56	0.72	*6.69*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW282**	**15 Dec 2020**	**0089_MW282_201215**	**Normal**	**EP2014041**	3.29	7.16	41.2	4.76	44.1	<0.02	1.1	1.94	11.7	2.08	*5.77*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW282**	**18 Mar 2021**	**0089_MW282_210318**	**Normal**	**EP2102955**	2.77	4.76	45.8	5.61	48.2	<0.02	1.3	2.05	12.6	2.17	*7.28*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW282**	**09 Jun 2021**	**0089_MW282_210609**	**Normal**	**EP2106514**	4.89	7.83	42.7	3.15	40.3	<0.02	1.4	2.75	16.9	2.94	*4.50*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW282**	**31 Aug 2021**	**0089_MW282_210831**	**Normal**	**EP2110064**	1.68	3.51	34.0	3.93	45.1	<0.02	0.6	1.05	7.00	1.48	*9.37*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
HSF	**MW282**	**13 Jan 2022**	**0089_MW282_220113**	**Normal**	**EP2200339**	1.00	2.81	51

Table 1 - Groundwater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfl		
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002
PFAS NEMP 2020 Drinking Water																*0.56*													
PFAS NEMP 2020 Freshwater 99%										0.00023*						19													
PFAS NEMP 2020 Recreational Water																**10**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
Accommodation Area	**MW288**	**06 Sep 2022**	**0089_MW288_220906**	**Normal**	**EP2211390**	<0.02	<0.02	0.02	<0.02	4.63	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW288**	**12 Dec 2022**	**0089_MW288_221212**	**Normal**	**EP2216878**	<0.02	<0.02	0.08	<0.02	1.80	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW288**	**14 Mar 2023**	**0089_MW288_230314**	**Normal**	**EP2303178**	<0.02	<0.02	0.02	<0.02	1.25	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW288**	**07 Jun 2023**	**0089_MW288_230607**	**Normal**	**EP2307500**	<0.02	<0.02	0.01	<0.02	1.22	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW288**	**05 Sep 2023**	**0089_MW288_230905**	**Normal**	**EP2312177**	<0.02	<0.02	<0.01	<0.02	0.64	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**18 Sep 2017**	**0089_MW289_S_170918**	**Normal**	**176030**	0.003	0.006	0.25	0.01	1.7	<0.002	0.002	0.003	0.010	0.005	0.011	0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	0.002	<0.001	<0.01	<0.005	<0.002
Accommodation Area	**MW289**	**17 Oct 2017**	**0089_MW289_S_171017**	**Normal**	**177985**	0.005	0.012	0.29	0.023	2.0	<0.002	0.003	<0.002	0.013	0.004	0.016	0.007	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	0.001	<0.001	<0.01	<0.03	<0.002
Accommodation Area	**MW289**	**15 Nov 2017**	**0089_MW289_S_171115**	**Normal**	**203378**	0.004	0.007	0.20	0.011	1.5	<0.002	0.003	<0.002	0.008	0.004	0.008	0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	0.002	<0.001	<0.01	<0.005	<0.002
Accommodation Area	**MW289**	**07 Dec 2017**	**0089_MW289_S_171207**	**Normal**	**204323**	0.006	0.010	0.17	0.01	1.6	<0.002	0.004	<0.002	0.008	0.002	0.009	0.004	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002
Accommodation Area	**MW289**	**15 Jan 2018**	**0089_MW289_S_180115**	**Normal**	**205568**	0.004	0.011	0.18	0.016	1.4	<0.002	<0.002	<0.002	0.005	0.002	0.006	0.003	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	0.001	<0.001	<0.01	<0.005	<0.002
Accommodation Area	**MW289**	**30 Mar 2020**	**0089_MW289_200330**	**Normal**	**EP2003313**	<0.02	<0.02	0.09	<0.02	0.53	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**22 Jul 2020**	**0089_MW289_200722**	**Normal**	**EP2007667**	0.03	0.02	0.17	<0.02	0.84	<0.02	<0.1	<0.02	0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**21 Sep 2020**	**0089_MW289_200921**	**Normal**	**EP2010077**	0.12	0.12	0.71	0.05	2.37	<0.02	<0.1	<0.02	0.11	0.03	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**21 Sep 2020**	**0089_QC101_200921**	**Field Duplicate**	**EP2010077**	0.12	0.12	0.73	0.04	1.59	<0.02	<0.1	<0.02	0.10	0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**21 Sep 2020**	**0089_QC201_200921**	**Interlab Duplicate**	**746269**	0.06	0.06	0.52	0.02	1.6	<0.01	<0.05	0.02	0.06	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
Accommodation Area	**MW289**	**15 Dec 2020**	**0089_MW289_201215**	**Normal**	**EP2014042**	0.04	0.05	0.30	0.03	1.42	<0.02	<0.1	<0.02	0.03	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**16 Mar 2021**	**0089_MW289_210316**	**Normal**	**EP2102837**	<0.02	<0.02	0.17	<0.02	0.80	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**09 Jun 2021**	**0089_MW289_210609**	**Normal**	**EP2106516**	0.10	0.09	0.51	0.03	2.01	<0.02	<0.1	<0.02	0.07	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**30 Aug 2021**	**0089_MW289_210830**	**Normal**	**EP2110016**	0.04	0.04	0.25	<0.02	0.76	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**30 Aug 2021**	**0089_QC103_210830**	**Field Duplicate**	**EP2110016**	0.04	0.04	0.24	<0.02	0.76	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**30 Aug 2021**	**0089_QC203_210830**	**Interlab Duplicate**	**820919**	0.02	0.03	0.19	0.02	0.65	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.1
Accommodation Area	**MW289**	**13 Jan 2022**	**0089_MW289_220113**	**Normal**	**EP2200340**	0.12	0.09	0.88	0.03	0.59	<0.02	<0.1	0.04	0.17	0.03	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**17 Mar 2022**	**0089_MW289_220317**	**Normal**	**EP2203138**	0.11	0.08	0.49	0.02	0.36	<0.02	<0.1	0.06	0.20	0.04	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**08 Jun 2022**	**0089_MW289_220608**	**Normal**	**EP2206969**	0.11	0.13	0.74	0.02	0.34	<0.02	<0.1	0.09	0.25	0.05	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**05 Sep 2022**	**0089_MW289_220905**	**Normal**	**EP2211345**	0.07	0.07	0.59	0.03	1.61	<0.02	<0.1	0.04	0.08	0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**13 Dec 2022**	**0089_MW289_221213**	**Normal**	**EP2216932**	0.04	0.06	0.56	0.03	1.49	<0.02	<0.1	<0.02	0.04	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**14 Mar 2023**	**0089_MW289_230314**	**Normal**	**EP2303178**	0.05	0.07	1.06	0.05	1.78	<0.02	<0.1	<0.02	0.06	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**06 Jun 2023**	**0089_MW289_230606**	**Normal**	**EP2307415**	0.04	0.05	0.56	0.02	1.40	<0.02	<0.1	<0.02	0.03	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
Accommodation Area	**MW289**	**04 Sep 2023**	**0089_MW289_230904**	**Normal**	**EP2312225**	0.03	0.04	0.32	0.02	1.16	<0.02	<0.1	<0.02	0.04	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW496**	**06 Sep 2022**	**0089_MW496_220906**	**Normal**	**EP2211389**	0.07	0.13	1.85	0.18	6.95	<0.02	<0.1	<0.02	0.22	0.05	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW496**	**13 Dec 2022**	**0089_MW496_221213**	**Normal**	**EP2216932**	0.06	0.07	1.08	0.14	8.00	<0.02	<0.1	<0.02	0.12	0.03	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW496**	**13 Mar 2023**	**0089_MW496_230313**	**Normal**	**EP2303119**	0.05	0.07	1.20	0.11	6.29	<0.02	<0.1	<0.02	0.16	0.03	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW496**	**06 Jun 2023**	**0089_MW496_230606**	**Normal**	**EP2307433**	0.10	0.12	1.06	0.09	8.16	<0.02	<0.1	<0.02	0.17	0.03	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW496**	**04 Sep 2023**	**0089_MW496_230904**	**Normal**	**EP2312225**	0.04	0.06	0.99	0.09	7.52	<0.02	<0.1	<0.02	0.16	0.03	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW500**	**10 Jan 2022**	**0089_MW500_220110**	**Normal**	**EP2200214**	0.17	0.57	13.6	5.59	45.1	<0.02	<0.1	0.13	1.30	0.23	*1.76*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW500**	**10 Jan 2022**	**0089_QC105_220110**	**Field Duplicate**	**EP2200214**	0.16	0.48	12.0	4.96	45.8	<0.02	<0.1	0.13	1.25	0.21	*1.60*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW500**	**10 Jan 2022**	**0089_QC205_220110**	**Interlab Duplicate**	**854607**	0.05	0.17	8.9	5.8	42	<0.01	<0.05	0.06	0.34	0.09	*1.4*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05
FTA	**MW500**	**14 Mar 2022**	**0089_MW500_220314**	**Normal**	**EP2202975**	0.26	0.63	11.4	2.91	45.3	<0.02	0.2	0.43	3.23	0.37	*1.40*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.10	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW500**	**07 Jun 2022**	**0089_MW500_220607**	**Normal**	**EP2206880**	0.84	2.01	24.2	2.00	49.3	<0.02	0.3	0.83	4.85	0.64	*1.83*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW500**	**05 Sep 2022**	**0089_MW500_220905**	**Normal**	**EP2211343**	0.32	0.70	13.3	2.27	57.8	<0.02	0.2	0.30	1.92	0.31	*1.22*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW500**	**12 Dec 2022**	**0089_MW500_221212**	**Normal**	**EP2216902**	0.25	0.44	8.60	2.68	39.3	<0.02	0.1	0.21	1.09	0.21	*0.78*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW500**	**13 Mar 2023**	**0089_MW500_230313**	**Normal**	**EP2303119**	0.43	0.70	12.0	4.93	26.1	<0.02	0.3	0.49	2.54	0.42	*2.12*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.11	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW500**	**06 Jun 2023**	**0089_MW500_230606**	**Normal**	**EP2307463**	0.22	0.30	6.80	1.51	31.3	<0.02	0.2	0.33	0.86	0.15	0.51	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
FTA	**MW500**	**05 Sep 2023**	**0089_MW500_230905**	**Normal**	**EP2312170**	1.60	2.06	16.1	3.45	44.4	<0.02	0.8	0.96	3.94	0.48	*1.20*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**30 Mar 2020**	**0089_MW516_200330**	**Normal**	**EP2003313**	0.09	0.16	2.21	0.25	12.3	<0.02	<0.1	0.16	0.23	0.05	0.20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**21 Jul 2020**	**0089_MW516_200721**	**Normal**	**EP2007611**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**21 Sep 2020**	**0089_MW516_200921**	**Normal**	**EP2010077**	0.14	0.19	2.53	0.25	11.3	<0.02	<0.1	<0.02	0.25	0.04	0.13	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**16 Dec 2020**	**0089_MW516_201216**	**Normal**	**EP2014087**	0.08	0.09	1.38	0.12	5.15	<0.02	<0.1	<0.02	0.16	0.02	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**18 Mar 2021**	**0089_MW516_210318**	**Normal**	**EP2102954**	0.08	0.08	1.61	0.15	11.0	<0.02	1.1	0.03	0.24	0.04	0.15	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**09 Jun 2021**	**0089_MW516_210609**	**Normal**	**EP2106515**	0.16	0.11	1.40	0.12	9.21	<0.02	<0.1	<0.02	0.15	0.03	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**31 Aug 2021**	**0089_MW516_210831**	**Normal**	**EP2110073**	0.15	0.12	1.42	0.09	4.80	<0.02	<0.1	<0.02	0.06	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**12 Jan 2022**	**0089_MW516_220112**	**Normal**	**EP2200288**	0.09	0.05	1.18	0.08	9.40	<0.02	<0.1	<0.02	0.14	0.02	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**17 Mar 2022**	**0089_MW516_220317**	**Normal**	**EP2203138**	0.10	0.04	0.84	0.11	8.54	<0.02	<0.1	0.11	0.11	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**08 Jun 2022**	**0089_MW516_220608**	**Normal**	**EP2206969**	0.06	0.05	0.90	0.12	10.4	<0.02	<0.1	<0.02	0.11	0.02	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**06 Sep 2022**	**0089_MW516_220906**	**Normal**	**EP2211389**	0.25	0.29	1.89	0.14	4.32	<0.02	<0.1	<0.02	0.23	0.03	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**13 Dec 2022**	**0089_MW516_221213**	**Normal**	**EP2216932**	0.08	0.03	0.39	0.03	1.62	<0.02	<0.1	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**13 Mar 2023**	**0089_MW516_230313**	**Normal**	**EP2303119**	<0.02	0.02	0.52	0.07	5.40	<0.02	<0.1	<0.02	0.06	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**06 Jun 2023**	**0089_MW516_230606**	**Normal**	**EP2307433**	0.02	0.03	0.59	0.11	8.70	<0.02	<0.1	<0.02	0.08	<0.02	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02
AVCAT Storage	**MW516**	**04 Sep 2023**	**0089_MW516_230904**	**Normal**	**EP2312225**	<0.02	0.02	0.51	0.08	4.80	<0.02	<0.1	0.03	0.08	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Freshwater 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:
First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

						uoroalkyl Sulfonamides				PFAS			Inorganics									Metals							
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																			
PFAS NEMP 2020 Freshwater 99%																													
PFAS NEMP 2020 Recreational Water										**2**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
FTA	**MW109**	**05 Sep 2022**	**0089_QC117_220905**	**Field Duplicate**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	*0.62*	0.78	0.92	<1	303	<1	303	9.18	9.10	96	0.45	20		93		20		1		64
FTA	**MW109**	**05 Sep 2022**	**0089_QC217_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	*0.39*	0.51	0.62																	
FTA	**MW109**	**12 Dec 2022**	**0089_MW109_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.02	<0.05	*0.86*	1.03	1.16	10	261	<1	271	8.04	7.94	77	0.64	22		83		15		<1		59
FTA	**MW109**	**13 Mar 2023**	**0089_MW109_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	***2.10***	2.70	2.96	<1	479	<1	479	16.1	13.8	214	7.75	25		101		41		<1		124
FTA	**MW109**	**13 Mar 2023**	**0089_QC107_230313**	**Field Duplicate**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	*1.76*	2.30	2.54																	
FTA	**MW109**	**13 Mar 2023**	**0089_QC207_230313**	**Interlab Duplicate**	**972487**	<0.05	<0.05	<0.05	<0.05	*1.74*	2.29	2.58																	
FTA	**MW109**	**06 Jun 2023**	**0089_MW109_230606**	**Normal**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	***2.13***	2.66	2.92	<1	411	<1	411	12.5	11.2	136	5.29	22		104		25		<1		92
FTA	**MW109**	**05 Sep 2023**	**0089_MW109_230905**	**Normal**	**EP2312170**	<0.05	<0.05	<0.02	<0.05	***2.57***	3.02	3.23	<1	298	<1	298	9.21	9.40	102	1.05	18		116		18		<1		49
FTA	**MW112**	**30 Oct 2010**	**DS3-MB01**	**Normal**	**EP1005976**																								
FTA	**MW112**	**22 Oct 2013**	**WA0001_D53_MB01**	**Normal**	**EP1308039**																								
FTA	**MW112**	**26 May 2015**	**D53_MB01**	**Normal**	**EP1510572**																								
FTA	**MW112**	**29 Sep 2015**	**WA0001_MB01**	**Normal**	**EP1514335**																								
FTA	**MW112**	**23 Feb 2016**	**D53_MB01**	**Normal**	**EP1601568**																								
FTA	**MW112**	**25 Oct 2016**	**D53_MB01**	**Normal**	**521581**																								
FTA	**MW112**	**25 Oct 2016**	**QC102**	**Field Duplicate**	**521581**																								
FTA	**MW112**	**25 Oct 2016**	**QC202**	**Interlab Duplicate**	**521581**																								
FTA	**MW112**	**08 Mar 2017**	**0089_MW112_S_170803**	**Normal**	**199045**	<0.005	<0.01	<0.002	<0.05					180					29	6.4			78		8.9		1.3		17
FTA	**MW112**	**20 Sep 2017**	**0089_MW112_D_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW112**	**20 Sep 2017**	**0089_MW112_S_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW112**	**18 Oct 2017**	**0089_MW112_D_171018**	**Normal**	**178113**	<0.05	<0.1	<0.02	<0.5																				
FTA	**MW112**	**18 Oct 2017**	**0089_MW112_S_171018**	**Normal**	**178113**	<0.05	<0.1	0.022	<0.5																				
FTA	**MW112**	**16 Nov 2017**	**0089_MW112_D_171116**	**Normal**	**203411**	<0.05	<0.1	<0.02	<0.5																				
FTA	**MW112**	**16 Nov 2017**	**0089_MW112_S_171116**	**Normal**	**203411**	<0.05	<0.1	<0.02	<0.5																				
FTA	**MW112**	**06 Dec 2017**	**0089_MW112_D_171206**	**Normal**	**204243**	<0.05	<0.1	<0.02	<0.5																				
FTA	**MW112**	**06 Dec 2017**	**0089_MW112_S_171206**	**Normal**	**204243**	<0.05	<0.1	<0.02	<0.5																				
FTA	**MW112**	**18 Jan 2018**	**0089_MW112_D_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW112**	**18 Jan 2018**	**0089_MW112_S_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW112**	**08 Jan 2020**	**0089_MW112_200108**	**Normal**	**EP2000179**	<0.05	<0.05	<0.02	<0.05	***24.5***	26.1	27.0	<1	185	<1	185	5.18	5.88	37	6.34	21		83		10		<1		21
FTA	**MW112**	**30 Mar 2020**	**0089_MW112_200330**	**Normal**	**EP2003333**	<0.05	<0.05	<0.02	<0.05	***71.0***	77.2	79.8	<1	187	<1	187	5.04	5.77	36	6.72	14		79		9		<1		25
FTA	**MW112**	**30 Mar 2020**	**0089_QC102_200330**	**Field Duplicate**	**EP2003333**	<0.05	<0.05	<0.02	<0.05	***71.0***	77.2	79.8	<1	184	<1	184	5.22	6.05	40	7.33	20		85		10		1		22
FTA	**MW112**	**30 Mar 2020**	**0089_QC202_200330**	**Interlab Duplicate**	**711144**	<0.05	<0.05	<0.05	<0.05	***37.2***	40.39	41.75	<20	200	<20	200			61			81		9.1		0.9		19	
FTA	**MW112**	**15 Jul 2020**	**0089_MW112_200715**	**Normal**	**EP2007385**	<0.05	<0.05	<0.02	<0.05	***83.9***	97.9	111	<1	315	<1	315	8.41	7.03	41	8.92	46		97		13		3		24
FTA	**MW112**	**21 Sep 2020**	**0089_MW112_200921**	**Normal**	**EP2010093**	<0.05	<0.05	<0.02	<0.05	***51.2***	59.4	65.9	<1	219	<1	219	5.73	5.79	31	0.50	23		79		11		1		21
FTA	**MW112**	**14 Dec 2020**	**0089_MW112_201214**	**Normal**	**EP2013984**	<0.05	<0.05	<0.02	<0.05	***49.1***	57.2	61.7	<1	241	<1	241	6.32	5.47	34	7.14	26		73		10		2		22
FTA	**MW112**	**16 Mar 2021**	**0089_MW112_210316**	**Normal**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	***51.0***	60.6	67.2	<1	211	<1	211	6.02	6.54	38	4.19	35		88		12		3		25
FTA	**MW112**	**16 Mar 2021**	**0089_QC112_210316**	**Field Duplicate**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	***39.4***	46.5	50.8	<1	213	<1	213	5.96	6.42	37	3.70	32		87		12		2		24
FTA	**MW112**	**16 Mar 2021**	**0089_QC212_210316**	**Interlab Duplicate**	**781350**	<0.05	<0.05	<0.05	<0.05	***41***	46.88	50.28	<10	320					49			80		14		2.3		28	
FTA	**MW112**	**08 Jun 2021**	**0089_MW112_210608**	**Normal**	**EP2106448**	<0.05	<0.05	<0.02	<0.05	***57.2***	65.6	71.4	<1	228	<1	228	6.13	6.15	33	0.14	31		84		11		2		23
FTA	**MW112**	**30 Aug 2021**	**0089_MW112_210830**	**Normal**	**EP2110020**	<0.05	<0.05	<0.02	<0.05	***39.3***	42.2	44.2	<1	222	<1	222	5.73	5.77	32	0.29	19		82		10		1		19
FTA	**MW112**	**10 Jan 2022**	**0089_MW112_220110**	**Normal**	**EP2200214**	<0.05	<0.05	<0.02	<0.05	***58.5***	63.2	65.1	<1	226	<1	226	5.71	4.83	32	8.38	14		66		7		<1		22
FTA	**MW112**	**14 Mar 2022**	**0089_MW112_220314**	**Normal**	**EP2202975**	<0.05	<0.05	<0.02	<0.05	***57.0***	61.6	65.2	<1	205	<1	205	5.24	5.38	28	1.36	17		73		9		<1		23
FTA	**MW112**	**14 Mar 2022**	**0089_QC105_220314**	**Field Duplicate**	**EP2202975**	<0.05	<0.05	<0.02	<0.05	***47.7***	52.1	55.4																	
FTA	**MW112**	**14 Mar 2022**	**0089_QC205_220314**	**Interlab Duplicate**	**872911**	<0.05	<0.05	<0.05	<0.05	***59.7***	63.08	65.02																	
FTA	**MW112**	**07 Jun 2022**	**0089_MW112_220607**	**Normal**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	***81.2***	83.3	85.7	<1	218	<1	218	5.31	5.05	25	2.53	12		75		9		<1		13
FTA	**MW112**	**07 Jun 2022**	**0089_QC105_220607**	**Field Duplicate**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	***88.8***	90.9	93.3																	
FTA	**MW112**	**07 Jun 2022**	**0089_QC205_220607**	**Interlab Duplicate**	**896805**	<0.008	<0.004	<0.004	<0.008	***43***	45	47																	
FTA	**MW112**	**05 Sep 2022**	**0089_MW112_220905**	**Normal**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	***67.6***	70.3	72.2	<1	219	<1	219	5.28	4.89	26	3.83	8		70		9		<1		15
FTA	**MW112**	**12 Dec 2022**	**0089_MW112_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.02	<0.05	***52.3***	54.5	55.7	6	224	<1	230	5.52	5.00	26	4.87	9		74		8		<1		15
FTA	**MW112**	**13 Mar 2023**	**0089_MW112_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	***21.7***	25.4	28.6	<1	233	<1	233	5.84	5.20	31	5.78	15		72		9		<1		20
FTA	**MW112**	**06 Jun 2023**	**0089_MW112_230606**	**Normal**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	***48.4***	57.1	63.8	<1	248	<1	248	6.88	6.15	41	5.58	37		81		11		3		26
FTA	**MW112**	**06 Jun 2023**	**0089_QC104_230606**	**Field Duplicate**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	***50.2***	60.3	67.6																	
FTA	**MW112**	**06 Jun 2023**	**0089_QC204_230606**	**Interlab Duplicate**	**997465**	<0.05	<0.05	<0.05	<0.05	***65***	74.06	81.77																	
FTA	**MW112**	**05 Sep 2023**	**0089_MW112_230905**	**Normal**	**EP2312170**	<0.05	<0.05	<0.02	<0.05	***41.4***	44.4	46.5	<1	214	<1	214	5.38	5.63	28	2.28	15		84		9		<1		16
FTA	**MW112**	**05 Sep 2023**	**0089_QC116_230905**	**Field Duplicate**	**EP2312170**	<0.05	<0.05	<0.02	<0.05	***38.2***	40.8	42.8																	
FTA	**MW112**	**05 Sep 2023**	**0089_QC216_230905**	**Interlab Duplicate**	**1023399**	<0.05	<0.05	<0.05	<0.05	***43***	45.59	47.13																	
FTA	**MW120**	**08 Mar 2017**	**0089_MW120_S_170803**	**Normal**	**199045**	<0.005	<0.01	<0.002	<0.05					230					58	4			80		23		2.2		28
FTA	**MW120**	**20 Sep 2017**	**0089_MW120_D_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW120**	**20 Sep 2017**	**0089_MW120_S_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW120**	**18 Oct 2017**	**0089_MW120_D_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																				
FTA	**MW120**	**18 Oct 2017**	**0089_MW120_S_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																				

Table 1 - Groundwater Analytical Results

						uoroalkyl Sulfonamides				PFAS			Inorganics								Metals							
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER list)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																		
PFAS NEMP 2020 Freshwater 99%																												
PFAS NEMP 2020 Recreational Water										**2**																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																							
FTA	**MW120**	**16 Nov 2017**	**0089_MW120_D_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																			
FTA	**MW120**	**16 Nov 2017**	**0089_MW120_S_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																			
FTA	**MW120**	**06 Dec 2017**	**0089_MW120_D_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW120**	**06 Dec 2017**	**0089_MW120_S_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW120**	**18 Jan 2018**	**0089_MW120_D_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW120**	**18 Jan 2018**	**0089_MW120_S_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW120**	**16 Dec 2019**	**0089_MW120_191216**	**Normal**	**EP1913380**	<0.05	<0.05	<0.02	<0.05	***9.98***	10.5	11.1	<1	262	<1	262	6.64	7.02	35	2.76	20		84		17		3		31
FTA	**MW120**	**30 Mar 2020**	**0089_MW120_200330**	**Normal**	**EP2003333**	<0.05	<0.05	<0.02	<0.05	***14.6***	15.4	16.2	<1	221	<1	221	5.98	7.24	40	9.50	21		86		19		3		30
FTA	**MW120**	**15 Jul 2020**	**0089_MW120_200715**	**Normal**	**EP2007385**	<0.05	<0.05	<0.02	<0.05	***6.75***	7.27	7.85	<1	245	<1	245	6.53	6.78	41	1.92	23		82		17		3		28
FTA	**MW120**	**15 Jul 2020**	**0089_QC106_200715**	**Field Duplicate**	**EP2007385**	<0.05	<0.05	<0.02	<0.05	***8.39***	8.91	9.51	<1	250	<1	250	6.63	6.68	41	0.36	23		82		16		2		28
FTA	**MW120**	**15 Jul 2020**	**0089_QC206_200215**	**Interlab Duplicate**	**732844**	<0.05	<0.05	<0.05	<0.05	***6.6***	6.98	7.38	<10	290	<20	290				39		100		17		2.2		36	
FTA	**MW120**	**14 Dec 2020**	**0089_MW120_201214**	**Normal**	**EP2013984**	<0.05	<0.05	<0.02	<0.05	***5.52***	5.84	6.16	<1	228	<1	228	6.06	5.92	37	1.18	22		67		15		3		29
FTA	**MW120**	**16 Mar 2021**	**0089_MW120_210316**	**Normal**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	***7.14***	7.55	8.06	<1	236	<1	236	6.22	6.67	38	3.48	21		78		17		3		30
FTA	**MW120**	**08 Jun 2021**	**0089_MW120_210608**	**Normal**	**EP2106448**	<0.05	<0.05	<0.02	<0.05	***6.13***	6.51	7.01	<1	235	<1	235	6.26	6.73	40	3.61	21		80		17		3		29
FTA	**MW120**	**30 Aug 2021**	**0089_MW120_210830**	**Normal**	**EP2110020**	<0.05	<0.05	<0.02	<0.05	***17.0***	18.8	21.1	<1	240	<1	240	6.57	6.88	46	2.30	23		78		19		3		31
FTA	**MW120**	**10 Jan 2022**	**0089_MW120_220110**	**Normal**	**EP2200214**	<0.05	<0.05	<0.02	<0.05	***13.8***	16.1	20.4	<1	258	<1	258	7.05	6.10	51	7.26	22		72		15		2		28
FTA	**MW120**	**10 Jan 2022**	**0089_QC104_220110**	**Field Duplicate**	**EP2200214**	<0.05	<0.05	<0.02	<0.05	***14.6***	16.9	20.7																	
FTA	**MW120**	**10 Jan 2022**	**0089_QC204_220110**	**Interlab Duplicate**	**854607**	<0.05	<0.05	<0.05	<0.05	***9.09***	10.82	13.36																	
FTA	**MW120**	**14 Mar 2022**	**0089_MW120_220314**	**Normal**	**EP2202975**	<0.05	<0.05	<0.02	<0.05	***8.15***	9.89	12.4	<1	232	<1	232	6.26	6.46	42	1.60	21		78		16		3		27
FTA	**MW120**	**14 Mar 2022**	**0089_QC104_220314**	**Field Duplicate**	**EP2202975**	<0.05	<0.05	<0.02	<0.05	***9.37***	11.1	13.7																	
FTA	**MW120**	**14 Mar 2022**	**0089_QC204_220314**	**Interlab Duplicate**	**872911**	<0.05	<0.05	<0.05	<0.05	***6.5***	7.02	7.69																	
FTA	**MW120**	**07 Jun 2022**	**0089_MW120_220607**	**Normal**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	***5.16***	5.70	6.49	<1	258	<1	258	6.85	6.77	44	0.64	22		79		17		3		31
FTA	**MW120**	**05 Sep 2022**	**0089_MW120_220905**	**Normal**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	***22.6***	24.7	28.4	<1	252	<1	252	6.85	6.63	51	1.62	18		72		18		3		34
FTA	**MW120**	**05 Sep 2022**	**0089_QC116_220905**	**Field Duplicate**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	***21.8***	24.0	27.6	<1	260	<1	260	7.10	6.68	52	3.04	21		73		18		3		34
FTA	**MW120**	**05 Sep 2022**	**0089_QC216_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	***17.28***	18.79	21																	
FTA	**MW120**	**12 Dec 2022**	**0089_MW120_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.02	<0.05	***15.7***	17.4	20.4	10	237	<1	248	6.80	6.91	50	0.80	21		76		19		3		34
FTA	**MW120**	**13 Mar 2023**	**0089_MW120_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	***4.79***	6.38	9.67	<1	258	<1	258	7.40	6.58	64	5.88	21		69		20		2		33
FTA	**MW120**	**13 Mar 2023**	**0089_QC105_230313**	**Field Duplicate**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	***5.49***	6.28	7.68																	
FTA	**MW120**	**13 Mar 2023**	**0089_QC205_230313**	**Interlab Duplicate**	**972487**	<0.05	<0.05	<0.05	<0.05	***6.19***	7.31	8.45																	
FTA	**MW120**	**06 Jun 2023**	**0089_MW120_230606**	**Normal**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	***5.07***	5.46	5.82	<1	247	<1	247	6.42	6.09	41	2.66	16		68		16		3		30
FTA	**MW120**	**06 Jun 2023**	**0089_QC103_230606**	**Field Duplicate**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	***4.62***	5.01	5.51																	
FTA	**MW120**	**06 Jun 2023**	**0089_QC203_230606**	**Interlab Duplicate**	**997465**	<0.05	<0.05	<0.05	<0.05	***4.4***	4.81	5.12																	
FTA	**MW120**	**05 Sep 2023**	**0089_MW120_230905**	**Normal**	**EP2312170**	<0.05	<0.05	<0.02	<0.05	***2.86***	3.08	3.40	<1	303	<1	303	8.54	7.44	75	6.93	18		90		19		3		30
FTA	**MW120**	**05 Sep 2023**	**0089_QC115_230905**	**Field Duplicate**	**EP2312170**	<0.05	<0.05	<0.02	<0.05	***2.83***	3.02	3.32																	
FTA	**MW120**	**05 Sep 2023**	**0089_QC215_230905**	**Interlab Duplicate**	**1023399**	<0.05	<0.05	<0.05	<0.05	***3***	3.17	3.42																	
FTA	**MW121**	**23 Feb 2016**	**D53_MB03A**	**Normal**	**EP1601568**																							
FTA	**MW121**	**25 Oct 2016**	**D53_MB03A**	**Normal**	**521581**																							
FTA	**MW121**	**08 Mar 2017**	**0089_MW121_S_170803**	**Normal**	**199045**	<0.005	<0.01	<0.002	<0.05					240					25	5.3			92		14		1.2		15
FTA	**MW121**	**20 Sep 2017**	**0089_MW121_D_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW121**	**20 Sep 2017**	**0089_MW121_S_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW121**	**18 Oct 2017**	**0089_MW121_D_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																			
FTA	**MW121**	**18 Oct 2017**	**0089_MW121_S_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																			
FTA	**MW121**	**16 Nov 2017**	**0089_MW121_D_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																			
FTA	**MW121**	**16 Nov 2017**	**0089_MW121_S_171116**	**Normal**	**203411**	0.008	<0.1	<0.002	<0.05																			
FTA	**MW121**	**06 Dec 2017**	**0089_MW121_D_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW121**	**06 Dec 2017**	**0089_MW121_S_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW121**	**18 Jan 2018**	**0089_MW121_D_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW121**	**18 Jan 2018**	**0089_MW121_S_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW121**	**16 Dec 2019**	**0089_MW121_191216**	**Normal**	**EP1913380**	<0.05	<0.05	<0.02	<0.05	***6.11***	7.09	7.33	<1	245	<1	245	5.57	5.53	15	0.37	12		76		12		2		16
FTA	**MW121**	**30 Mar 2020**	**0089_MW121_200330**	**Normal**	**EP2003333**	<0.05	<0.05	<0.02	<0.05	***62.8***	67.7	70.6	<1	204	<1	204	5.60	6.93	40	10.6	19		87		14		5		30
FTA	**MW121**	**15 Jul 2020**	**0089_MW121_200715**	**Normal**	**EP2007385**	<0.05	<0.05	<0.02	<0.05	***40.4***	43.4	44.9	<1	226	<1	226	6.55	6.98	50	3.20	30		91		15		3		26
FTA	**MW121**	**21 Sep 2020**	**0089_MW121_200921**	**Normal**	**EP2010093**	<0.05	<0.05	<0.02	<0.05	***7.09***	7.67	7.89	<1	241	<1	241	6.56	6.90	44	2.54	24		86		17		3		26
FTA	**MW121**	**14 Dec 2020**	**0089_MW121_201214**	**Normal**	**EP2013992**	<0.05	<0.05	<0.02	<0.05	***8.12***	8.74	8.94	<1	235	<1	235	6.37	7.29	44	6.71	21		95		16		4		26
FTA	**MW121**	**16 Mar 2021**	**0089_MW121_210316**	**Normal**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	***47.0***	52.0	56.2	<1	211	<1	211	5.74	6.75	40	8.06	19		84		15		4		28
FTA	**MW121**	**08 Jun 2021**	**0089_MW121_210608**	**Normal**	**EP2106448**	<0.05	<0.05	<0.02	<0.05	***13.4***	15.3	16.0	<1	218	<1	218	6.40	7.10	54	5.16	25		89		16		3		29
FTA	**MW121**	**30 Aug 2021**	**0089_MW121_210830**	**Normal**	**EP2110020**	<0.05	<0.05	<0.02	<0.05	***87.9***	91.3	93.3	<1	229	<1	229	6.03	5.80	39	1.95	17		69		11		4		31
FTA	**MW121**	**10 Jan 2022**	**0089_MW121_220110**	**Normal**	**EP2200214**	<0.05	<0.05	<0.02	<0.05	*0.33*	0.39	0.39	<1	257	<1	257	5.84	5.16	17	6.22	11		66		12		2		19
FTA	**MW121**	**14 Mar 2022**	**0089_MW121_220314**	**Normal**	**EP2202975**	<0.05	<0.05	<0.02	<0.05	*0.49*	0.57	0.60	<1	270	<1	270	6.28	5.56	24	6.03	10		76		13		2		15
FTA	**MW121**	**14 Mar 2022**	**0089_QC102_220314**	**Field Duplicate**	**EP2202975**	<0.05	<0.05	<0.02	<0.05	*0.59*	0.69	0.72																	
FTA	**MW121**	**14 Mar 2022**	**0089_QC202_220314**	**Interlab Duplicate**	**872911**	<0.05	<0.05	<0.05	<0.05	0.03	<0.05	<0.1																	
FTA	**MW121**	**07 Jun 2022**	**0089_MW121_220607**	**Normal**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	***5.89***	6.81	7.19	<1	294	<1	294	8.14	7.35	70	5.11	14		97		14		2		30
FTA	**MW121**	**07 Jun 2022**	**0089_QC101_220607**	**Field Duplicate**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	***6.12***	7.02	7.45																	
FTA	**MW121**	**07 Jun 2022**	**0089_QC201_220607**	**Interlab Duplicate**	**896805**	<0.008	<0.004	<0.004	<0.008	***4.9***	5.7	6.0																	
FTA	**MW121**	**05 Sep 2022**	**0089_MW121_220905**	**Normal**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	*0.19*	0.23	0.23	<1	252	<1	252	5.93	4.98	25	8.72	9		66		10		3		18
FTA	**MW121**	**12 Dec 2022**	**0089_MW121_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.02	<0.05	*0.16*	0.24	0.24	11	290	<1	301	6.67	4.94	19	14.9	6		72		10		2		11
FTA	**MW121**	**13 Mar 2023**	**0089_MW121_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	*0.46*	0.60	0.62	<1	262	<1	262	6.34	5.66	34	5.61	7		78		13		2		15
FTA	**MW121**	**06 Jun 2023**	**0089_MW121_230606**	**Normal**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	***11.5***	13.7	14.8	<1	274	<1	274	7.67	8.08	55	2.60	31		101		17		3		36
FTA	**MW121**	**05 Sep 2023**	**0089_MW121_230905**	**Normal**	**EP2312170**	<0.05	<0.05	<0.02	<0.05	*0.96*	1.11	1.16	<1	590	<1	590	13.2	6.69	43	32.9	12		90		14		2		23
FTA	**MW123**	**08 Mar 2017**	**0089_MW123_S_170803**	**Normal**	**199045**	<0.005	<0.01	<0.002	<0.05					240					33	1.4			73		15		2.2		25
FTA	**MW123**	**20 Sep 2017**	**0089_MW123_D_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW123**	**20 Sep 2017**	**0089_MW123_S_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW123**	**18 Oct 2017**	**0089_MW123_D_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																			
FTA	**MW123**	**18 Oct 2017**	**0089_MW123_S_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																			
FTA	**MW123**	**16 Nov 2017**	**0089_MW123_D_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																			
FTA	**MW123**	**16 Nov 2017**	**0089_MW123_S_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																			
FTA	**MW123**	**06 Dec 2017**	**0089_MW123_D_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW123**	**06 Dec 2017**	**0089_MW123_S_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW123**	**18 Jan 2018**	**0089_MW123_D_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW123**	**18 Jan 2018**	**0089_MW123_S_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW123**	**16 Dec 2019**	**0089_MW123_191216**	**Normal**	**EP1913380**	<0.05	<0.05	<0.02	<0.05	*1.31*	1.88	1.99	<1	354	<1	354	8.06	6.91	29	7.69	8		90		13		5		28
FTA	**MW123**	**16 Dec 2019**	**0089_QC101_191216**	**Field Duplicate**	**EP1913380**	<0.05	<0.05	<0.02	<0.05	*1.31*	1.84	1.94	<1	296	<1	296	6.91	7.13	30	1.61	7		92		14		5		29
FTA	**MW123**	**16 Dec 2019**	**0089_QC201_191216**	**Interlab Duplicate**	**694635**	<0.05	<0.05	<0.05	<0.05	*0.88*	1.22	1.29	<10	1,900					99			67		13		3.4		37	
FTA	**MW123**	**18 Dec 2019**	**0089_QC201_191218**	**Interlab Duplicate**	**695528**	<0.05	<0.05	<0.05	<0.05	*0.09*	0.09	0.1	<10	450					630			180		65		20		340	
FTA	**MW123**	**14 Dec 2020**	**0089_MW123_201214**	**Normal**	**EP2013992**	<0.05	<0.05	<0.02	<0.05	*0.21*	0.67	0.72	<1	231	<1	231	15.5	14.9	354	2.13	44		97		32		12		163
FTA	**MW123**	**16 Mar 2021**	**0089_MW123_210316**	**Normal**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	*0.53*	1.27	1.35	<1	191	<1	191	5.29	5.72	47	3.96	7		74		10		3		26
FTA	**MW123**	**16 Mar 2021**	**0089_QC108_210316**	**Field Duplicate**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	*0.55*	1.30	1.39	<1	218	<1	218	5.88	5.77	48	0.94	8		74		10		3		27
FTA	**MW123**	**16 Mar 2021**	**0089_QC208_210316**	**Interlab Duplicate**	**781350**	<0.05	<0.05	<0.05	<0.05	*0.47*	1.14	1.25	<10	670					64			69		9.7		2.2		25	
FTA	**MW123**	**08 Jun 2021**	**0089_MW123_210608**	**Normal**	**EP2106448**	<0.05	<0.05	<0.02	<0.05	*0.75*	1.69	1.82	<1	334	<1	334	9.28	8.47	88	4.56	6		94		17		3		53
FTA	**MW123**	**08 Jun 2021**	**0089_QC102_210608**	**Field Duplicate**	**EP2106448**	<0.05	<0.05	<0.02	<0.05	*0.65*	1.48	1.62	<1	346	<1	346	9.70	9.05	95	3.43	5		98		19		3		58
FTA	**MW123**	**08 Jun 2021**	**0089_QC202_210608**	**Interlab Duplicate**	**802464**	<0.05	<0.05	<0.05	<0.05	*0.64*	1.47	1.66	17	980					99			66		18		2.2		56	
FTA	**MW123**	**30 Aug 2021**	**0089_MW123_210830**	**Normal**	**EP2110020**	<0.05	<0.05	<0.02	<0.05	*0.27*	0.65	0.73	<1	261	<1	261	7.39	7.23	69	1.06	11		86		14		2		40
FTA	**MW123**	**10 Jan 2022**	**0089_MW123_220110**	**Normal**	**EP2200214**	<0.05	<0.05	<0.02	<0.05	*0.35*	0.94	1.03	<1	293	<1	293	8.15	7.32	77	5.33	6		75		15		<1		54

Table 1 - Groundwater Analytical Results

						uoroalkyl Sulfonamides				PFAS			Inorganics								Metals							
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																		
PFAS NEMP 2020 Freshwater 99%																												
PFAS NEMP 2020 Recreational Water										**2**																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																							
FTA	**MW123**	**10 Jan 2022**	**0089_QC101_220110**	**Field Duplicate**	**EP2200214**	<0.05	<0.05	<0.02	<0.05	*0.32*	0.90	0.98																
FTA	**MW123**	**10 Jan 2022**	**0089_QC201_220110**	**Interlab Duplicate**	**854607**	<0.05	<0.05	<0.05	<0.05	*0.2*	0.53	0.64																
FTA	**MW123**	**14 Mar 2022**	**0089_MW123_220314**	**Normal**	**EP2202975**	<0.05	<0.05	<0.02	<0.05	*0.76*	2.22	2.44	<1	434	<1	434	17.3	16.7	299	1.86	9		103		51		4		166
FTA	**MW123**	**07 Jun 2022**	**0089_MW123_220607**	**Normal**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	*0.62*	1.43	1.61	<1	410	<1	410	12.8	12.1	158	2.78	6		109		30		5		93
FTA	**MW123**	**05 Sep 2022**	**0089_MW123_220905**	**Normal**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	*0.28*	0.61	0.71	<1	410	<1	410	13.3	12.4	179	3.49	5		100		33		5		106
FTA	**MW123**	**05 Sep 2022**	**0089_QC114_220905**	**Field Duplicate**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	*0.45*	0.90	1.03	<1	383	<1	383	12.3	11.7	159	2.43	7		101		30		4		94
FTA	**MW123**	**05 Sep 2022**	**0089_QC214_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	*0.21*	0.41	0.49																
FTA	**MW123**	**12 Dec 2022**	**0089_MW123_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.02	<0.05	0.07	0.17	0.17	<1	378	<1	378	10.2	10.0	87	0.87	9		95		21		1		81
FTA	**MW123**	**12 Dec 2022**	**0089_QC114_221212**	**Field Duplicate**	**EP2216902**	<0.05	<0.05	<0.02	<0.05	0.07	0.18	0.18																
FTA	**MW123**	**12 Dec 2022**	**0089_QC214_221212**	**Interlab Duplicate**	**950091**	<0.05	<0.05	<0.05	<0.05	0.06	0.16	0.18																
FTA	**MW123**	**13 Mar 2023**	**0089_MW123_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	***2.27***	2.97	3.25	<1	670	<1	670	24.9	22.2	395	5.80	19		113		67		3		252
FTA	**MW123**	**13 Mar 2023**	**0089_QC101_230313**	**Field Duplicate**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	*1.88*	2.52	2.80	<1	744	<1	744	27.0	23.7	416	6.52	18		131		73		3		254
FTA	**MW123**	**13 Mar 2023**	**0089_QC201_230313**	**Interlab Duplicate**	**972487**	<0.05	<0.05	<0.05	<0.05	***2.13***	2.87	3.28																
FTA	**MW123**	**06 Jun 2023**	**0089_MW123_230606**	**Normal**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	*1.66*	2.17	2.36	<1	554	<1	554	17.0	15.4	200	5.22	16		116		32		4		157
FTA	**MW123**	**06 Jun 2023**	**0089_QC101_230606**	**Field Duplicate**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	***2.38***	3.15	3.45	<1	792	<1	792	28.7	27.7	457	1.79	<1		119		77		3		353
FTA	**MW123**	**06 Jun 2023**	**0089_QC201_230606**	**Interlab Duplicate**	**997465**	<0.05	<0.05	<0.05	<0.05	*1.91*	2.48	2.81																
FTA	**MW123**	**05 Sep 2023**	**0089_MW123_230905**	**Normal**	**EP2312170**	<0.05	<0.05	<0.02	<0.05	*0.48*	0.64	0.70	<1	436	<1	436	13.1	14.0	154	3.38	3		136		29		3		110
FTA	**MW123**	**05 Sep 2023**	**0089_QC114_230905**	**Field Duplicate**	**EP2312170**	<0.05	<0.05	<0.02	<0.05	*0.48*	0.64	0.70	<1	277	<1	277	8.38	8.01	95	2.28	8		94		14		3		48
FTA	**MW123**	**05 Sep 2023**	**0089_QC214_230905**	**Interlab Duplicate**	**1023399**	<0.05	<0.05	<0.05	<0.05	*0.58*	0.73	0.8																
FTA	**MW124**	**08 Mar 2017**	**0089_MW124_S_170803**	**Normal**	**199045**	<0.005	<0.01	<0.002	<0.05					420					14,000	0.84			440		990		260		8,000
FTA	**MW124**	**20 Sep 2017**	**0089_MW124_D_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW124**	**20 Sep 2017**	**0089_MW124_S_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW124**	**18 Oct 2017**	**0089_MW124_D_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																			
FTA	**MW124**	**18 Oct 2017**	**0089_MW124_S_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																			
FTA	**MW124**	**16 Nov 2017**	**0089_MW124_D_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																			
FTA	**MW124**	**16 Nov 2017**	**0089_MW124_S_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																			
FTA	**MW124**	**06 Dec 2017**	**0089_MW124_D_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW124**	**06 Dec 2017**	**0089_MW124_S_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW124**	**18 Jan 2018**	**0089_MW124_D_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW124**	**18 Jan 2018**	**0089_MW124_S_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW124**	**09 Jan 2020**	**0089_MW124_200109**	**Normal**	**EP2000249**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	328	<1	328	473	554	15,100	7.86	1,950		544		1,260		468		9,450
FTA	**MW124**	**09 Jan 2020**	**0089_QC101_200109**	**Field Duplicate**	**EP2000249**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	332	<1	332	470	554	15,000	8.24	1,910		541		1,250		473		9,470
FTA	**MW124**	**09 Jan 2020**	**0089_QC201_200109**	**Interlab Duplicate**	**696324**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	220					17,000			460		1,000		310		9,200	
FTA	**MW124**	**30 Mar 2020**	**0089_MW124_200330**	**Normal**	**EP2003333**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	308	<1	308	484	536	15,400	5.02	2,110		510		1,320		483		8,950
FTA	**MW124**	**15 Jul 2020**	**0089_MW124_200715**	**Normal**	**EP2007382**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	206	<1	206	574	652	18,300	6.34	2,580		501		1,410		581		11,400
FTA	**MW124**	**22 Sep 2020**	**0089_MW124_200922**	**Normal**	**EP2010151**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	419	<1	419	522	546	16,600	2.20	2,190		502		1,250		487		9,320
FTA	**MW124**	**14 Dec 2020**	**0089_MW124_201214**	**Normal**	**EP2013984**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	359	<1	359	504	544	16,000	3.85	2,170		516		1,280		498		9,200
FTA	**MW124**	**15 Mar 2021**	**0089_MW124_210315**	**Normal**	**EP2102752**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	324	<1	324	497	531	15,800	3.31	2,160		482		1,210		459		9,100
FTA	**MW124**	**08 Jun 2021**	**0089_MW124_210608**	**Normal**	**EP2106448**	<0.05	<0.05	<0.02	<0.05	*1.74*	2.43	2.72	<1	360	<1	360	462	482	14,700	2.14	1,920		447		1,110		459		8,200
FTA	**MW124**	**30 Aug 2021**	**0089_MW124_210830**	**Normal**	**EP2110019**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	390	<1	390	432	490	13,800	6.27	1,700		440		1,120		405		8,410
FTA	**MW124**	**10 Jan 2022**	**0089_MW124_220110**	**Normal**	**EP2200216**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	536	<1	536	432	466	13,700	3.80	1,680		434		1,030		395		8,040
FTA	**MW124**	**14 Mar 2022**	**0089_MW124_220314**	**Normal**	**EP2202976**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	343	<1	343	470	481	15,000	1.16	1,900		457		1,130		420		8,140
FTA	**MW124**	**07 Jun 2022**	**0089_MW124_220607**	**Normal**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	343	<1	343	449	403	14,300	5.34	1,860		431		970		382		6,720
FTA	**MW124**	**05 Sep 2022**	**0089_MW124_220905**	**Normal**	**EP2211345**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	416	<1	416	470	488	15,000	1.87	1,840		450		1,110		433		8,340
FTA	**MW124**	**05 Sep 2022**	**0089_QC102_220905**	**Field Duplicate**	**EP2211345**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	408	<1	408	461	483	14,700	2.31	1,840		444		1,110		431		8,240
FTA	**MW124**	**05 Sep 2022**	**0089_QC202_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1																	
FTA	**MW124**	**12 Dec 2022**	**0089_MW124_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	423	<1	423	465	453	14,800	1.30	1,890		394		1,020		358		7,830
FTA	**MW124**	**13 Mar 2023**	**0089_MW124_230313**	**Normal**	**EP2303085**	<0.05	<0.05	<0.02	<0.05	<0.01	0.03	0.03	<1	346	<1	346	502	435	16,100	7.17	1,980		399		958		360		7,520
FTA	**MW124**	**07 Jun 2023**	**0089_MW124_230607**	**Normal**	**EP2307500**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	338	<1	338	392	464	12,400	8.51	1,680		378		858		285		8,450
FTA	**MW124**	**05 Sep 2023**	**0089_MW124_230905**	**Normal**	**EP2312183**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	381	<1	381	434	520	13,800	9.00	1,790		452		1,160		430		8,990
FTA	**MW125**	**08 Mar 2017**	**0089_MW125_S_170803**	**Normal**	**199045**	<0.005	<0.01	<0.002	<0.05					420					15,000	-0.59			410		1,000		270		8,200
FTA	**MW125**	**20 Sep 2017**	**0089_MW125_D_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW125**	**20 Sep 2017**	**0089_MW125_S_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW125**	**18 Oct 2017**	**0089_MW125_D_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																			
FTA	**MW125**	**18 Oct 2017**	**0089_MW125_S_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																			
FTA	**MW125**	**18 Oct 2017**	**0089_QC1MW_171018**	**Field Duplicate**	**178113**	<0.02	<0.05	<0.002	<0.2																			
FTA	**MW125**	**18 Oct 2017**	**0089_QC2MW_171018**	**Interlab Duplicate**	**568770**	<0.05	<0.05	<0.05	<0.05	*0.27*	0.35	0.4																
FTA	**MW125**	**16 Nov 2017**	**0089_MW125_D_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																			
FTA	**MW125**	**16 Nov 2017**	**0089_MW125_S_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																			
FTA	**MW125**	**06 Dec 2017**	**0089_MW125_D_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW125**	**06 Dec 2017**	**0089_MW125_S_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW125**	**18 Jan 2018**	**0089_MW125_D_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW125**	**18 Jan 2018**	**0089_MW125_S_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW125**	**18 Jan 2018**	**0089_QC1MW_180118**	**Field Duplicate**	**205797**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW125**	**18 Jan 2018**	**0089_QC2MW_180118**	**Interlab Duplicate**	**581139**	<0.05	<0.05	<0.05	<0.05	*0.15*	0.21	0.26																
FTA	**MW125**	**18 Jan 2018**	**0089_QC2MW_180118**	**Interlab Duplicate**	**581139**	<0.05	<0.05	<0.05	<0.05																			
FTA	**MW125**	**09 Jan 2020**	**0089_MW125_200109**	**Normal**	**EP2000249**	<0.05	<0.05	<0.02	<0.05	*0.66*	0.88	1.03	<1	310	<1	310	487	585	15,500	9.16	2,100		552		1,360		498		9,960
FTA	**MW125**	**30 Mar 2020**	**0089_MW125_200330**	**Normal**	**EP2003333**	<0.05	<0.05	<0.02	<0.05	*0.44*	0.59	0.66	<1	504	<1	504	511	609	16,100	8.68	2,270		591		1,530		549		10,100
FTA	**MW125**	**15 Jul 2020**	**0089_MW125_200715**	**Normal**	**EP2007382**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	288	<1	288	568	667	18,100	8.03	2,480		560		1,450		596		11,600
FTA	**MW125**	**22 Sep 2020**	**0089_MW125_200922**	**Normal**	**EP2010151**	<0.05	<0.05	<0.02	<0.05	*0.25*	0.34	0.40	<1	329	<1	329	525	551	16,700	2.40	2,270		492		1,280		504		9,380
FTA	**MW125**	**14 Dec 2020**	**0089_MW125_201214**	**Normal**	**EP2013984**	<0.05	<0.05	<0.02	<0.05	*0.38*	0.55	0.63	<1	342	<1	342	507	578	16,100	6.60	2,200		536		1,380		531		9,760
FTA	**MW125**	**15 Mar 2021**	**0089_MW125_210315**	**Normal**	**EP2102752**	<0.05	<0.05	<0.02	<0.05	*0.43*	0.70	0.82	<1	448	<1	448	533	586	16,900	4.68	2,290		542		1,350		508		9,990
FTA	**MW125**	**08 Jun 2021**	**0089_MW125_210608**	**Normal**	**EP2106448**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	407	<1	407	484	516	15,400	3.27	1,980		471		1,200		499		8,770
FTA	**MW125**	**30 Aug 2021**	**0089_MW125_210830**	**Normal**	**EP2110019**	<0.05	<0.05	<0.02	<0.05	*0.28*	0.39	0.46	<1	441	<1	441	477	554	15,200	7.51	1,890		476		1,300		459		9,470
FTA	**MW125**	**30 Aug 2021**	**0089_QC101_210830**	**Field Duplicate**	**EP2110019**	<0.05	<0.05	<0.02	<0.05	*0.28*	0.39	0.46	<1	416	<1	416	453	539	14,400	8.68	1,850		469		1,260		448		9,210
FTA	**MW125**	**30 Aug 2021**	**0089_QC201_210830**	**Interlab Duplicate**	**820919**	<0.05	<0.05	<0.05	<0.05	*0.27*	0.36	0.43																	
FTA	**MW125**	**10 Jan 2022**	**0089_MW125_220110**	**Normal**	**EP2200216**	<0.05	<0.05	<0.02	<0.05	*0.63*	1.05	1.22	<1	382	<1	382	419	420	13,300	0.17	1,730		401		948		354		7,200
FTA	**MW125**	**14 Mar 2022**	**0089_MW125_220314**	**Normal**	**EP2202976**	<0.05	<0.05	<0.02	<0.05	*0.72*	1.14	1.32	<1	417	<1	417	504	504	16,100	0.04	2,000		473		1,210		439		8,490
FTA	**MW125**	**14 Mar 2022**	**0089_QC103_220314**	**Field Duplicate**	**EP2202976**	<0.05	<0.05	<0.02	<0.05	*0.79*	1.22	1.41	<1	415	<1	415	486	519	15,500	3.21	1,960		497		1,240		453		8,740
FTA	**MW125**	**14 Mar 2022**	**0089_QC203_220314**	**Interlab Duplicate**	**872911**	<0.05	<0.05	<0.05	<0.05	*0.66*	0.98	1.17																	
FTA	**MW125**	**07 Jun 2022**	**0089_MW125_220607**	**Normal**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	*0.98*	1.45	1.69	<1	587	<1	587	498	450	15,800	5.03	1,930		476		1,100		420		7,470
FTA	**MW125**	**05 Sep 2022**	**0089_MW125_220905**	**Normal**	**EP2211345**	<0.05	<0.05	<0.02	<0.05	*0.50*	0.80	0.92	<1	433	<1	433	483	518	15,400	3.58	1,900		466		1,220		469		8,800
FTA	**MW125**	**12 Dec 2022**	**0089_MW125_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.02	<0.05	*0.69*	1.10	1.29	<1	407	<1	407	488	477	15,500	1.07	2,030		418		1,080		374		8,230
FTA	**MW125**	**12 Dec 2022**	**0089_QC103_221212**	**Field Duplicate**	**EP2216878**	<0.05	<0.05	<0.02	<0.05	*0.74*	1.12	1.33	<1	399	<1	399	512	544	16,300	3.05	2,140		486		1,240		434		9,360
FTA	**MW125**	**12 Dec 2022**	**0089_QC203_221212**	**Interlab Duplicate**	**950091**	<0.05	<0.05	<0.05	<0.05	*0.61*	1.01	1.21																	
FTA	**MW125**	**13 Mar 2023**	**0089_MW125_230313**	**Normal**	**EP2303085**	<0.05	<0.05	<0.02	<0.05	*0.75*	1.21	1.42	<1	379	<1	379	524	445	16,800	8.16	2,050		404		990		367		7,680
FTA	**MW125**	**07 Jun 2023**	**0089_MW125_230607**	**Normal**	**EP2307500**	<0.05	<0.05	<0.02	<0.05	*0.84*	1.35	1.66	<1	354	<1	354	458	531	14,500	7.36	2,030		434		993		332		9,640
FTA	**MW125**	**05 Sep 2023**	**0089_MW125_230905**	**Normal**	**EP2312183**	<0.05	<0.05	<0.02	<0.05	*0.40*	0.62	0.72	<1	416	<1	416	419	474	13,200	6.09	1,850		433		1,120		393		8,040
FTA	**MW126**	**08 Mar 2017**	**0089_MW126_S_170803**	**Normal**	**199045**	<0.005	<0.01	<0.002	<0.05					610					15,000	-0.87			400		1,000		250		7,900
FTA	**MW126**	**20 Sep 2017**	**0089_MW126_D_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW126**	**20 Sep 2017**	**0089_MW126_S_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW126**	**18 Oct 2017**	**0089_MW126_D_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																			

						uoroalkyl Sulfonamides				PFAS			Inorganics								Metals								
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																		
PFAS NEMP 2020 Freshwater 99%																												
PFAS NEMP 2020 Recreational Water										**2**																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																							
FTA	**MW126**	**18 Oct 2017**	**0089_MW126_S_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																			
FTA	**MW126**	**16 Nov 2017**	**0089_MW126_D_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																			
FTA	**MW126**	**16 Nov 2017**	**0089_MW126_S_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																			
FTA	**MW126**	**06 Dec 2017**	**0089_MW126_D_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW126**	**06 Dec 2017**	**0089_MW126_S_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW126**	**18 Jan 2018**	**0089_MW126_D_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW126**	**18 Jan 2018**	**0089_MW126_S_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																			
FTA	**MW126**	**08 Jan 2020**	**0089_MW126_200108**	**Normal**	**EP2000179**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	502	<1	502	499	520	16,000	2.05	1,800		469		1,240		467		8,790
FTA	**MW126**	**31 Mar 2020**	**0089_MW126_200331**	**Normal**	**EP2003364**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	478	<1	478	462	536	14,600	7.46	1,950		547		1,360		464		8,860
FTA	**MW126**	**15 Jul 2020**	**0089_MW126_200715**	**Normal**	**EP2007382**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	346	<1	346	524	579	16,700	5.07	2,190		539		1,280		480		10,000
FTA	**MW126**	**22 Sep 2020**	**0089_MW126_200922**	**Normal**	**EP2010151**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	443	<1	443	495	552	15,800	5.40	1,960		511		1,310		482		9,340
FTA	**MW126**	**14 Dec 2020**	**0089_MW126_201214**	**Normal**	**EP2013984**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	485	<1	485	472	522	15,000	5.08	1,860		505		1,290		461		8,710
FTA	**MW126**	**15 Mar 2021**	**0089_MW126_210315**	**Normal**	**EP2102752**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	400	<1	400	499	541	15,900	4.00	2,040		506		1,280		453		9,160
FTA	**MW126**	**08 Jun 2021**	**0089_MW126_210608**	**Normal**	**EP2106448**	<0.05	<0.05	<0.02	<0.05	*0.32*	0.55	0.65	<1	444	<1	444	448	485	14,200	3.95	1,870		451		1,160		448		8,180
FTA	**MW126**	**30 Aug 2021**	**0089_MW126_210830**	**Normal**	**EP2110019**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	594	<1	594	448	506	14,300	5.99	1,600		454		1,220		403		8,560
FTA	**MW126**	**10 Jan 2022**	**0089_MW126_220110**	**Normal**	**EP2200211**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	639	<1	639	444	451	14,100	0.78	1,590		419		1,050		361		7,680
FTA	**MW126**	**14 Mar 2022**	**0089_MW126_220314**	**Normal**	**EP2202976**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	616	<1	616	484	471	15,500	1.38	1,660		444		1,160		394		7,890
FTA	**MW126**	**07 Jun 2022**	**0089_MW126_220607**	**Normal**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	546	<1	546	493	406	15,800	9.64	1,740		436		1,020		369		6,690
FTA	**MW126**	**05 Sep 2022**	**0089_MW126_220905**	**Normal**	**EP2211345**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	682	<1	682	477	465	15,400	1.30	1,400		408		1,130		397		7,850
FTA	**MW126**	**12 Dec 2022**	**0089_MW126_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	765	<1	765	495	448	15,900	4.95	1,510		384		1,070		335		7,650
FTA	**MW126**	**13 Mar 2023**	**0089_MW126_230313**	**Normal**	**EP2303085**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	655	<1	655	538	446	17,400	9.30	1,640		389		1,050		345		7,630
FTA	**MW126**	**13 Mar 2023**	**0089_QC110_230313**	**Field Duplicate**	**EP2303085**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	648	<1	648	482	411	15,400	7.97	1,670		363		963		323		7,020
FTA	**MW126**	**13 Mar 2023**	**0089_QC210_230313**	**Interlab Duplicate**	**972487**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
FTA	**MW126**	**07 Jun 2023**	**0089_MW126_230607**	**Normal**	**EP2307500**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	559	<1	559	383	422	12,100	4.75	1,480		366		815		253		7,580
FTA	**MW126**	**05 Sep 2023**	**0089_MW126_230905**	**Normal**	**EP2312183**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	506	<1	506	231	216	7,080	3.47	1,040		247		557		182		3,520
FTA	**MW127**	**08 Mar 2017**	**0089_MW127_S_170803**	**Normal**	**199045**	<0.005	<0.01	<0.002	<0.05					630					13,000	-0.38			320		910		220		6,800
FTA	**MW127**	**08 Mar 2017**	**0089_QC1MW_S_170803**	**Field Duplicate**	**199045**	<0.005	<0.01	<0.002	<0.05					630					13,000	-0.53			300		870		210		7,000
FTA	**MW127**	**04 Aug 2017**	**0089_QC2MW_170803**	**Interlab Duplicate**	**557474**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	650					14,000			440		1,300		320		7,800	
FTA	**MW127**	**20 Sep 2017**	**0089_MW127_D_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW127**	**20 Sep 2017**	**0089_MW127_S_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW127**	**18 Oct 2017**	**0089_MW127_D_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																				
FTA	**MW127**	**18 Oct 2017**	**0089_MW127_S_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																				
FTA	**MW127**	**16 Nov 2017**	**0089_MW127_D_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																				
FTA	**MW127**	**16 Nov 2017**	**0089_MW127_S_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																				
FTA	**MW127**	**16 Nov 2017**	**0089_QC1MW_171116**	**Field Duplicate**	**203411**	<0.005	<0.1	<0.002	<0.05																				
FTA	**MW127**	**16 Nov 2017**	**0089_QC2MW_171116**	**Interlab Duplicate**	**573296**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
FTA	**MW127**	**06 Dec 2017**	**0089_MW127_D_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW127**	**06 Dec 2017**	**0089_MW127_S_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW127**	**18 Jan 2018**	**0089_MW127_D_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW127**	**18 Jan 2018**	**0089_MW127_S_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW127**	**08 Jan 2020**	**0089_MW127_200108**	**Normal**	**EP2000179**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	483	<1	483	438	459	14,000	2.40	1,600		394		1,120		408		7,750
FTA	**MW127**	**31 Mar 2020**	**0089_MW127_200331**	**Normal**	**EP2003364**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	471	<1	471	445	520	14,100	7.74	1,840		457		1,360		461		8,590
FTA	**MW127**	**31 Mar 2020**	**0089_QC104_200331**	**Field Duplicate**	**EP2003364**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	474	<1	474	443	491	14,000	5.19	1,840		433		1,280		431		8,120
FTA	**MW127**	**31 Mar 2020**	**0089_QC204_200331**	**Interlab Duplicate**	**711434**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<20	370	<20	370			16,000			400		1,100		310		8,000	
FTA	**MW127**	**15 Jul 2020**	**0089_MW127_200715**	**Normal**	**EP2007382**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	510	<1	510	447	461	14,200	1.61	1,730		411		1,110		368		7,820
FTA	**MW127**	**22 Sep 2020**	**0089_MW127_200922**	**Normal**	**EP2010151**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	488	<1	488	470	517	15,000	4.72	1,790		433		1,270		440		8,720
FTA	**MW127**	**14 Dec 2020**	**0089_MW127_201214**	**Normal**	**EP2013984**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	470	<1	470	465	528	14,800	6.26	1,850		467		1,320		470		8,820
FTA	**MW127**	**15 Mar 2021**	**0089_MW127_210315**	**Normal**	**EP2102752**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	438	<1	438	460	508	14,600	4.88	1,920		432		1,230		431		8,600
FTA	**MW127**	**08 Jun 2021**	**0089_MW127_210608**	**Normal**	**EP2106448**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	478	<1	478	447	471	14,200	2.63	1,770		398		1,150		440		7,940
FTA	**MW127**	**30 Aug 2021**	**0089_MW127_210830**	**Normal**	**EP2110019**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	559	<1	559	429	489	13,600	6.50	1,640		408		1,190		398		8,280
FTA	**MW127**	**10 Jan 2022**	**0089_MW127_220110**	**Normal**	**EP2200211**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	486	<1	486	383	391	12,100	1.08	1,530		364		931		315		6,630
FTA	**MW127**	**14 Mar 2022**	**0089_MW127_220314**	**Normal**	**EP2202976**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	488	<1	488	433	413	13,800	2.30	1,620		385		1,050		345		6,870
FTA	**MW127**	**07 Jun 2022**	**0089_MW127_220607**	**Normal**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	498	<1	498	453	397	14,400	6.52	1,760		401		1,010		364		6,550
FTA	**MW127**	**05 Sep 2022**	**0089_MW127_220905**	**Normal**	**EP2211345**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	509	<1	509	443	431	14,200	1.36	1,550		383		1,070		369		7,230
FTA	**MW127**	**05 Sep 2022**	**0089_QC113_220905**	**Field Duplicate**	**EP2211345**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	509	<1	509	420	466	13,400	5.13	1,550		411		1,160		400		7,810
FTA	**MW127**	**05 Sep 2022**	**0089_QC213_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
FTA	**MW127**	**12 Dec 2022**	**0089_MW127_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	634	<1	634	445	477	14,000	3.45	1,820		412		1,140		365		8,130
FTA	**MW127**	**12 Dec 2022**	**0089_QC113_221212**	**Field Duplicate**	**EP2216878**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	602	<1	602	453	421	14,400	3.73	1,680		357		1,010		322		7,160
FTA	**MW127**	**12 Dec 2022**	**0089_QC213_221212**	**Interlab Duplicate**	**950091**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
FTA	**MW127**	**13 Mar 2023**	**0089_MW127_230313**	**Normal**	**EP2303085**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	528	<1	528	464	399	14,800	7.54	1,750		352		940		322		6,810
FTA	**MW127**	**07 Jun 2023**	**0089_MW127_230607**	**Normal**	**EP2307500**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	522	<1	522	414	459	13,100	5.16	1,630		368		914		272		8,240
FTA	**MW127**	**05 Sep 2023**	**0089_MW127_230905**	**Normal**	**EP2312183**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	608	<1	608	424	452	13,400	3.15	1,640		392		1,130		359		7,590
FTA	**MW128**	**08 Mar 2017**	**0089_MW128_S_170803**	**Normal**	**199045**	<0.005	<0.01	<0.002	<0.05					310					28	3.6			100		18		4.9		32
FTA	**MW128**	**20 Sep 2017**	**0089_MW128_D_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW128**	**20 Sep 2017**	**0089_MW128_S_170920**	**Normal**	**176250**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW128**	**20 Sep 2017**	**0089_QC1MW_170920**	**Field Duplicate**	**176250**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW128**	**20 Sep 2017**	**0089_QC2MW_170920**	**Interlab Duplicate**	**564343**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
FTA	**MW128**	**18 Oct 2017**	**0089_MW128_D_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																				
FTA	**MW128**	**18 Oct 2017**	**0089_MW128_S_171018**	**Normal**	**178113**	<0.02	<0.05	<0.002	<0.2																				
FTA	**MW128**	**16 Nov 2017**	**0089_MW128_D_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																				
FTA	**MW128**	**16 Nov 2017**	**0089_MW128_S_171116**	**Normal**	**203411**	<0.005	<0.1	<0.002	<0.05																				
FTA	**MW128**	**06 Dec 2017**	**0089_MW128_D_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW128**	**06 Dec 2017**	**0089_MW128_S_171206**	**Normal**	**204243**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW128**	**06 Dec 2017**	**0089_QC1MW_171206**	**Field Duplicate**	**204243**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW128**	**06 Dec 2017**	**0089_QC2MW_171206**	**Interlab Duplicate**	**576599**	<0.05	<0.05	<0.05	<0.05	***6.33***	6.38	6.52																	
FTA	**MW128**	**18 Jan 2018**	**0089_MW128_D_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW128**	**18 Jan 2018**	**0089_MW128_S_180118**	**Normal**	**205797**	<0.005	<0.01	<0.002	<0.05																				
FTA	**MW128**	**08 Jun 2022**	**0089_MW128_220608**	**Normal**	**EP2206971**	<0.05	<0.05	<0.02	<0.05	***6.54***	6.63	6.68	<1	462	<1	462	10.7	9.63	41	5.47	17		106		30		5		40
FTA	**MW128**	**05 Sep 2022**	**0089_MW128_220905**	**Normal**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	***7.79***	7.93	8.02	<1	326	<1	326	8.32	7.92	45	2.47	26		68		26		5		52
FTA	**MW128**	**12 Dec 2022**	**0089_MW128_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.02	<0.05	***6.76***	6.86	6.99	<1	410	<1	410	15.5	14.6	233	2.96	35		112		50		13		105
FTA	**MW128**	**07 Jun 2023**	**0089_MW128_230607**	**Normal**	**EP2307555**	<0.05	<0.05	<0.02	<0.05	*1.74*	1.79	1.79	<1	271	<1	271	9.38	8.95	120	2.37	28		96		28		1		42
FTA	**MW128**	**05 Sep 2023**	**0089_MW128_230905**	**Normal**	**EP2312170**	<0.05	<0.05	<0.02	<0.05	*1.54*	1.57	1.57	<1	587	<1	587	15.5	9.13	120	25.8	17		104		24		2		44
Demolition Ground	**MW139**	**30 Oct 2010**	**C24-MB01**	**Normal**	**EP1005976**																							
Demolition Ground	**MW139**	**18 Oct 2013**	**WA0006_C24_MB01**	**Normal**	**EP1307981**																							
Demolition Ground	**MW139**	**26 May 2015**	**C24_MB01**	**Normal**	**EP1510572**																							
Demolition Ground	**MW139**	**29 Sep 2015**	**C24_MB01**	**Normal**	**EP1514335**																							
Demolition Ground	**MW139**	**25 Oct 2016**	**C24_MB01**	**Normal**	**521581**																							
Demolition Ground	**MW139**	**01 Aug 2017**	**0089_MW139_S_170801**	**Normal**	**198918**	<0.005	<0.01	<0.002	<0.05					200					37	6.3			81		12		2.0		27
Demolition Ground	**MW139**	**19 Sep 2017**	**0089_MW139_D_170919**	**Normal**	**176140**	<0.005	<0.01	<0.002	<0.05																				
Demolition Ground	**MW139**	**19 Sep 2017**	**0089_MW139_S_170919**	**Normal**	**176140**	<0.005	<0.01	<0.002	<0.05																				
Demolition Ground	**MW139**	**17 Oct 2017**	**0089_MW139_D_171017**	**Normal**	**177985**	<0.005	<0.05	<0.002	<0.05																				
Demolition Ground	**MW139**	**17 Oct 2017**	**0089_MW139_S_171017**	**Normal**	**177985**	<0.005	<0.05	<0.002	<0.05																				

Table 1 - Groundwater Analytical Results

	uoroalkyl Sulfonamides				PFAS			Inorganics									Metals							
	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting	0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water					*0.07*																			
PFAS NEMP 2020 Freshwater 99%																								
PFAS NEMP 2020 Recreational Water					**2**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																			
Demolition Ground	**MW139**	**20 Nov 2017**	**0089_MW139_D_171120**	**Normal**	**203545**	<0.005	<0.1	<0.002	<0.05																	
Demolition Ground	**MW139**	**20 Nov 2017**	**0089_MW139_S_171120**	**Normal**	**203545**	<0.005	<0.1	<0.002	<0.05																	
Demolition Ground	**MW139**	**04 Dec 2017**	**0089_MW139_D_171204**	**Normal**	**204124**	<0.005	<0.02	<0.002	<0.05																	
Demolition Ground	**MW139**	**04 Dec 2017**	**0089_MW139_S_171204**	**Normal**	**204124**	<0.005	<0.02	<0.002	<0.05																	
Demolition Ground	**MW139**	**17 Jan 2018**	**0089_MW139_D_1801117**	**Normal**	**205691**	<0.005	<0.01	<0.002	<0.05																	
Demolition Ground	**MW139**	**17 Jan 2018**	**0089_MW139_S_1801117**	**Normal**	**205691**	<0.005	<0.01	<0.002	<0.05																	
Demolition Ground	**MW139**	**01 Feb 2018**	**0089_MW139_D_180201**	**Normal**	**206292**	<0.005	<0.01	<0.002	<0.05		160					27	9.0			72		8.4		1.4		18
Demolition Ground	**MW139**	**01 Feb 2018**	**0089_MW139_I_180201**	**Normal**	**206292**	<0.005	<0.01	<0.002	<0.05		160					25	9.0			71		8.4		1.4		17
Demolition Ground	**MW139**	**01 Feb 2018**	**0089_MW139_S_180201**	**Normal**	**206292**	<0.005	<0.01	<0.002	<0.05		160					27	8.7			69		8.8		1.5		19
Demolition Ground	**MW139**	**01 Feb 2018**	**0089_QC6MW_180201**	**Field Duplicate**	**206292**	<0.005	<0.01	<0.002	<0.05		160					34	6.7			72		8.6		1.9		18
Demolition Ground	**MW139**	**01 Feb 2018**	**0089_QC7MW_180201**	**Interlab Duplicate**	**582979**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	120	<10	120			45		75		8.7		1.1		19	
Demolition Ground	**MW139**	**08 Jan 2020**	**0089_MW139_200108**	**Normal**	**EP2000179**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	207	<1	207	46.3	49.5	1,400	3.26	130		152		104		39		743
Demolition Ground	**MW139**	**08 Jan 2020**	**0089_QC101_200108**	**Field Duplicate**	**EP2000179**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	206	<1	206	47.3	50.0	1,430	2.79	136		153		106		40		750
Demolition Ground	**MW139**	**08 Jan 2020**	**0089_QC201_200108**	**Interlab Duplicate**	**696100**	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1	<10	240					2,200		140		92		28		710	
Demolition Ground	**MW139**	**30 Mar 2020**	**0089_MW139_200330**	**Normal**	**EP2003308**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	262	<1	262	102	107	3,200	2.68	300		204		249		90		1,710
Demolition Ground	**MW139**	**20 Jul 2020**	**0089_MW139_200720**	**Normal**	**EP2007544**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	302	<1	302	142	155	4,440	4.23	521		206		376		116		2,540
Demolition Ground	**MW139**	**22 Sep 2020**	**0089_MW139_200922**	**Normal**	**EP2010151**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	198	<1	198	58.8	56.9	1,770	1.69	238		134		134		45		874
Demolition Ground	**MW139**	**14 Dec 2020**	**0089_MW139_201214**	**Normal**	**EP2013983**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	258	<1	258	118	113	3,670	2.04	447		214		283		90		1,770
Demolition Ground	**MW139**	**16 Mar 2021**	**0089_MW139_210316**	**Normal**	**EP2102837**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	272	<1	272	71.3	71.8	2,180	0.36	210		165		161		63		1,120
Demolition Ground	**MW139**	**08 Jun 2021**	**0089_MW139_210608**	**Normal**	**EP2106464**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	155	<1	155	34.1	33.6	993	0.70	145		106		80		25		486
Demolition Ground	**MW139**	**08 Jun 2021**	**0089_QC101_210608**	**Field Duplicate**	**EP2106464**	<0.05	<0.05	<0.02	<0.05	<0.01	0.06	0.06	<1	174	<1	174	36.0	36.3	1,040	0.31	155		102		87		29		535
Demolition Ground	**MW139**	**08 Jun 2021**	**0089_QC201_210608**	**Interlab Duplicate**	**802464**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	11	190					2,100		130		130		36		960	
Demolition Ground	**MW139**	**31 Aug 2021**	**0089_MW139_210831**	**Normal**	**EP2110071**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	149	<1	149	4.47	4.87	41	4.35	16		66		8		2		20
Demolition Ground	**MW139**	**10 Jan 2022**	**0089_MW139_220110**	**Normal**	**EP2200214**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	147	<1	147	4.43	4.17	39	3.10	19		50		7		2		24
Demolition Ground	**MW139**	**15 Mar 2022**	**0089_MW139_220315**	**Normal**	**EP2203018**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	278	<1	278	104	110	3,230	2.84	365		220		241		100		1,770
Demolition Ground	**MW139**	**08 Jun 2022**	**0089_MW139_220608**	**Normal**	**EP2206969**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	312	<1	312	129	119	4,020	3.93	448		208		316		92		1,850
Demolition Ground	**MW139**	**05 Sep 2022**	**0089_MW139_220905**	**Normal**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	173	<1	173	21.6	21.5	595	0.24	66		82		50		15		297
Demolition Ground	**MW139**	**14 Nov 2022**	**0089_MW139_221114**	**Normal**	**EP2215357**																							
Demolition Ground	**MW139**	**12 Dec 2022**	**0089_MW139_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	160	<1	160	10.3	9.51	226	4.07	36		66		18		5		106
Demolition Ground	**MW139**	**15 Mar 2023**	**0089_MW139_230315**	**Normal**	**EP2303226**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	228	<1	228	45.3	44.5	1,340	0.86	141		125		90		32		691
Demolition Ground	**MW139**	**07 Jun 2023**	**0089_MW139_230607**	**Normal**	**EP2307497**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	196	<1	196	19.1	17.8	500	3.78	54		80		33		10		248
Demolition Ground	**MW139**	**07 Jun 2023**	**0089_QC110_230607**	**Field Duplicate**	**EP2307497**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	205	<1	205	25.6	24.7	712	1.75	68		95		46		14		364
Demolition Ground	**MW139**	**07 Jun 2023**	**0089_QC210_230607**	**Interlab Duplicate**	**997465**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
Demolition Ground	**MW139**	**11 Sep 2023**	**0089_MW139_230911**	**Normal**	**EP2312528**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	219	<1	219	48.8	44.0	1,430	5.18	198		112		104		32		668
Demolition Ground	**MW141**	**30 Oct 2010**	**C24-MBO3**	**Normal**	**EP1005976**																							
Demolition Ground	**MW141**	**18 Oct 2013**	**WA0006_C24_MB03**	**Normal**	**EP1307981**																							
Demolition Ground	**MW141**	**26 May 2015**	**C24_MB03**	**Normal**	**EP1510572**																							
Demolition Ground	**MW141**	**29 Sep 2015**	**C24_MB03**	**Normal**	**EP1514335**																							
Demolition Ground	**MW141**	**25 Oct 2016**	**C24_MB03**	**Normal**	**521581**																							
Demolition Ground	**MW141**	**01 Aug 2017**	**0089_MW141_S_170801**	**Normal**	**198918**	<0.005	<0.01	<0.002	<0.05					420					4,900	2.8			260		330		96		2,900
Demolition Ground	**MW141**	**19 Sep 2017**	**0089_MW141_D_170919**	**Normal**	**176140**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW141**	**19 Sep 2017**	**0089_MW141_S_170919**	**Normal**	**176140**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW141**	**19 Sep 2017**	**0089_QC1MW_170919**	**Field Duplicate**	**176140**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW141**	**19 Sep 2017**	**0089_QC2MW_170919**	**Interlab Duplicate**	**564343**	<0.05	<0.05	<0.05	<0.05	***106***	137.82	142.42																	
Demolition Ground	**MW141**	**17 Oct 2017**	**0089_MW141_D_171017**	**Normal**	**177985**	<0.05	<0.1	<0.02	<0.5																			
Demolition Ground	**MW141**	**17 Oct 2017**	**0089_MW141_S_171017**	**Normal**	**177985**	<0.05	<0.1	<0.02	<0.5																			
Demolition Ground	**MW141**	**20 Nov 2017**	**0089_MW141_D_171120**	**Normal**	**203545**	<0.2	<0.5	<0.1	<2.5																			
Demolition Ground	**MW141**	**20 Nov 2017**	**0089_MW141_S_171120**	**Normal**	**203545**	<0.2	<0.5	<0.1	<2.5																			
Demolition Ground	**MW141**	**04 Dec 2017**	**0089_MW141_D_171204**	**Normal**	**204124**	<0.1	<0.2	<0.04	<1																			
Demolition Ground	**MW141**	**04 Dec 2017**	**0089_MW141_S_171204**	**Normal**	**204124**	<0.1	<0.2	<0.04	<1																			
Demolition Ground	**MW141**	**17 Jan 2018**	**0089_MW141_D_1801117**	**Normal**	**205691**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW141**	**17 Jan 2018**	**0089_MW141_S_1801117**	**Normal**	**205691**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW141**	**01 Feb 2018**	**0089_MW141_D_180201**	**Normal**	**206292**	<0.05	<0.1	<0.02	<0.5					400					6,700	3.7			270		470		130		4,000
Demolition Ground	**MW141**	**01 Feb 2018**	**0089_MW141_I_180201**	**Normal**	**206292**	<0.05	<0.1	<0.02	<0.5					400					7,100	-0.72			270		460		130		3,800
Demolition Ground	**MW141**	**01 Feb 2018**	**0089_MW141_S_180201**	**Normal**	**206292**	<0.05	<0.1	<0.02	<0.5					410					4,500	-0.93			240		300		86		2,400
Demolition Ground	**MW141**	**08 Jan 2020**	**0089_MW141_200108**	**Normal**	**EP2000179**	<0.05	<0.05	<0.02	<0.05	***71.5***	90.7	93.0	<1	423	<1	423	230	230	7,220	0.13	866		334		521		184		3,800
Demolition Ground	**MW141**	**30 Mar 2020**	**0089_MW141_200330**	**Normal**	**EP2003308**	<0.05	<0.05	<0.02	<0.05	***64.3***	75.9	78.0	<1	388	<1	388	336	337	10,700	0.08	1,290		426		797		306		5,570
Demolition Ground	**MW141**	**20 Jul 2020**	**0089_MW141_200720**	**Normal**	**EP2007544**	<0.05	<0.05	<0.02	<0.05	***62.4***	79.7	82.5	<1	374	<1	374	340	385	10,700	6.14	1,500		374		858		309		6,620
Demolition Ground	**MW141**	**23 Sep 2020**	**0089_MW141_200923**	**Normal**	**EP2010220**	<0.05	<0.05	<0.02	<0.05	***78.1***	96.1	99.6	<1	393	<1	393	310	306	9,800	0.65	1,220		382		700		282		5,100
Demolition Ground	**MW141**	**14 Dec 2020**	**0089_MW141_201214**	**Normal**	**EP2013975**	<0.05	<0.05	<0.02	<0.05	***50.1***	62.4	64.5	<1	346	<1	346	304	315	9,590	1.78	1,260		396		732		280		5,230
Demolition Ground	**MW141**	**16 Mar 2021**	**0089_MW141_210316**	**Normal**	**EP2102837**	<0.05	<0.05	<0.02	<0.05	***39.1***	47.3	49.1	<1	340	<1	340	362	404	11,400	5.42	1,630		432		907		363		6,860
Demolition Ground	**MW141**	**08 Jun 2021**	**0089_MW141_210608**	**Normal**	**EP2106464**	<0.05	<0.05	<0.02	<0.05	***45.7***	55.9	57.5	<1	400	<1	400	346	350	11,000	0.62	1,320		396		784		323		5,920
Demolition Ground	**MW141**	**31 Aug 2021**	**0089_MW141_210831**	**Normal**	**EP2110071**	<0.05	<0.05	<0.02	<0.05	***116***	138	143	<1	466	<1	466	257	263	8,060	1.06	994		368		577		203		4,410
Demolition Ground	**MW141**	**10 Jan 2022**	**0089_MW141_220110**	**Normal**	**EP2200214**	<0.05	<0.05	<0.02	<0.05	***201***	236	243	<1	494	<1	494	218	204	6,790	3.46	825		337		412		141		3,440
Demolition Ground	**MW141**	**10 Jan 2022**	**0089_QC112_220110**	**Field Duplicate**	**EP2200214**	<0.05	<0.05	<0.02	<0.05	***177***	213	218																	
Demolition Ground	**MW141**	**10 Jan 2022**	**0089_QC212_220110**	**Interlab Duplicate**	**854607**	<0.05	<0.05	<0.05	<0.05	***187***	220.91	226.99																	
Demolition Ground	**MW141**	**15 Mar 2022**	**0089_MW141_220315**	**Normal**	**EP2203018**	<0.05	<0.05	<0.02	<0.05	***112***	138	142	<1	386	<1	386	306	312	9,690	0.90	1,200		400		717		268		5,190
Demolition Ground	**MW141**	**08 Jun 2022**	**0089_MW141_220608**	**Normal**	**EP2206969**	<0.05	<0.05	<0.02	<0.05	***53.6***	62.1	64.8	<1	383	<1	383	322	354	10,100	4.63	1,430		410		863		318		5,840
Demolition Ground	**MW141**	**05 Sep 2022**	**0089_MW141_220905**	**Normal**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	***131***	150	154	<1	475	<1	475	265	258	8,390	1.39	923		412		607		209		4,190
Demolition Ground	**MW141**	**05 Sep 2022**	**0089_QC101_220905**	**Field Duplicate**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	***129***	148	151	<1	600	<1	600	287	287	9,060	0.05	933		396		679		241		4,710
Demolition Ground	**MW141**	**05 Sep 2022**	**0089_QC201_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	***82***	90.58	92.98																	
Demolition Ground	**MW141**	**12 Dec 2022**	**0089_MW141_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.02	<0.05	***144***	152	155	<1	526	<1	526	130	122	3,880	3.23	484		235		263		94		1,980
Demolition Ground	**MW141**	**12 Dec 2022**	**0089_QC101_221212**	**Field Duplicate**	**EP2216902**	<0.05	<0.05	<0.02	<0.05	***158***	166	169	<1	543	<1	543	198	192	6,110	1.55	705		299		421		137		3,190
Demolition Ground	**MW141**	**12 Dec 2022**	**0089_QC201_221212**	**Interlab Duplicate**	**950091**	<0.05	<0.05	<0.05	<0.05	***104***	113.16	114.8																	
Demolition Ground	**MW141**	**15 Mar 2023**	**0089_MW141_230315**	**Normal**	**EP2303226**	<0.05	<0.05	<0.02	<0.05	***91.6***	108	110	<1	599	<1	599	265	285	8,340	3.71	836		394		612		174		4,840
Demolition Ground	**MW141**	**07 Jun 2023**	**0089_MW141_230607**	**Normal**	**EP2307497**	<0.05	<0.05	<0.02	<0.05	***65.7***	75.8	77.8	<1	410	<1	410	308	340	9,700	4.97	1,250		459		684		216		5,870
Demolition Ground	**MW141**	**11 Sep 2023**	**0089_MW141_230911**	**Normal**	**EP2312528**	<0.05	<0.05	<0.02	<0.05	***40.3***	44.7	46.1	<1	448	<1	448	334	343	10,500	1.28	1,410		396		781		301		5,780
Demolition Ground	**MW142**	**01 Aug 2017**	**0089_MW142_S_170801**	**Normal**	**198918**	<0.005	<0.01	<0.002	<0.05					330					4,000	1.6			140		290		85		2,400
Demolition Ground	**MW142**	**19 Sep 2017**	**0089_MW142_D_170919**	**Normal**	**176140**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW142**	**19 Sep 2017**	**0089_MW142_S_170919**	**Normal**	**176140**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW142**	**17 Oct 2017**	**0089_MW142_D_171017**	**Normal**	**177985**	<0.005	<0.05	<0.002	<0.05																			
Demolition Ground	**MW142**	**17 Oct 2017**	**0089_MW142_S_171017**	**Normal**	**177985**	<0.005	<0.05	<0.002	<0.05																			
Demolition Ground	**MW142**	**17 Oct 2017**	**0089_QC1MW_171017**	**Field Duplicate**	**177985**	<0.005	<0.05	<0.002	<0.05																			
Demolition Ground	**MW142**	**17 Oct 2017**	**0089_QC2MW_171017**	**Interlab Duplicate**	**568770**	<0.05	<0.05	<0.05	<0.05	***3.41***	3.93	3.98																	
Demolition Ground	**MW142**	**20 Nov 2017**	**0089_MW142_D_171120**	**Normal**	**203545**	<0.005	<0.1	<0.002	<0.05																			
Demolition Ground	**MW142**	**20 Nov 2017**	**0089_MW142_S_171120**	**Normal**	**203545**	<0.005	<0.1	<0.002	<0.05																			
Demolition Ground	**MW142**	**20 Nov 2017**	**0089_QC1MW_171120**	**Field Duplicate**	**203545**	<0.005	<0.1	<0.002	<0.05																			
Demolition Ground	**MW142**	**20 Nov 2017**	**0089_QC2MW_171120**	**Interlab Duplicate**	**573488**	<0.05	<0.05	<0.05	<0.05	***2.97***	3.58	3.67																	
Demolition Ground	**MW142**	**04 Dec 2017**	**0089_MW142_D_171204**	**Normal**	**204124**	<0.005	<0.2	<0.002	<0.05																			
Demolition Ground	**MW142**	**04 Dec 2017**	**0089_MW142_S_171204**	**Normal**	**204124**	<0.005	<0.2	<0.002	<0.05																			
Demolition Ground	**MW142**	**04 Dec 2017**	**0089_QC1MW_171204**	**Field Duplicate**	**204124**	<0.005	<0.02	<0.002	<0.05																			
Demolition Ground	**MW142**	**04 Dec 2017**	**0089_QC2MW_171204**	**Interlab Duplicate**	**576083**	<0.05	<0.05	<0.05	<0.05	***3.3***	4.34	4.41																	

						uoroalkyl Sulfonamides				PFAS			Inorganics								Metals								
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																		
PFAS NEMP 2020 Freshwater 99%																												
PFAS NEMP 2020 Recreational Water										**2**																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																							
Demolition Ground	**MW142**	**17 Jan 2018**	**0089_MW142_D_1801117**	**Normal**	**205691**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW142**	**17 Jan 2018**	**0089_MW142_S_1801117**	**Normal**	**205691**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW142**	**01 Feb 2018**	**0089_MW142_D_180201**	**Normal**	**206292**	<0.005	<0.01	<0.002	<0.05					280					10,000	0.83			270		700		210		5,800
Demolition Ground	**MW142**	**01 Feb 2018**	**0089_MW142_I_180201**	**Normal**	**206292**	<0.005	<0.01	<0.002	<0.05					300					8,700	-1.2			230		580		160		4,800
Demolition Ground	**MW142**	**01 Feb 2018**	**0089_MW142_S_180201**	**Normal**	**206292**	<0.005	<0.01	<0.002	<0.05					340					4,000	-0.91			150		280		80		2,200
Demolition Ground	**MW142**	**08 Jan 2020**	**0089_MW142_200108**	**Normal**	**EP2000179**	<0.05	<0.05	<0.02	<0.05	***24.3***	42.9	44.7	<1	481	<1	481	236	268	7,420	6.36	822		350		636		185		4,450
Demolition Ground	**MW142**	**30 Mar 2020**	**0089_MW142_200330**	**Normal**	**EP2003308**	<0.05	<0.05	<0.02	<0.05	***41.8***	69.5	71.5	<1	609	<1	609	306	326	9,670	3.28	993		475		797		272		5,290
Demolition Ground	**MW142**	**20 Jul 2020**	**0089_MW142_200720**	**Normal**	**EP2007544**	<0.05	<0.05	<0.02	<0.05	***3.10***	3.85	3.97	<1	362	<1	362	422	488	13,300	7.24	1,890		454		1,080		469		8,370
Demolition Ground	**MW142**	**23 Sep 2020**	**0089_MW142_200923**	**Normal**	**EP2010220**	<0.05	<0.05	<0.02	<0.05	***5.58***	7.02	7.23	<1	359	<1	359	533	542	17,000	0.82	2,220		495		1,240		511		9,240
Demolition Ground	**MW142**	**14 Dec 2020**	**0089_MW142_201214**	**Normal**	**EP2013975**	<0.05	<0.05	<0.02	<0.05	***5.61***	7.32	7.54	<1	331	<1	331	376	406	11,900	3.83	1,640		412		948		369		6,860
Demolition Ground	**MW142**	**16 Mar 2021**	**0089_MW142_210316**	**Normal**	**EP2102837**	<0.05	<0.05	<0.02	<0.05	***6.83***	8.79	9.03	<1	303	<1	303	400	468	12,600	7.84	1,870		445		1,070		420		7,990
Demolition Ground	**MW142**	**08 Jun 2021**	**0089_MW142_210608**	**Normal**	**EP2106464**	<0.05	<0.05	<0.02	<0.05	***6.71***	9.39	9.72	<1	324	<1	324	400	415	12,800	1.86	1,550		401		941		392		7,070
Demolition Ground	**MW142**	**30 Aug 2021**	**0089_MW142_210830**	**Normal**	**EP2110016**	<0.05	<0.05	<0.02	<0.05	***5.66***	7.50	7.77	<1	358	<1	358	223	243	7,010	4.38	870		291		554		196		4,100
Demolition Ground	**MW142**	**10 Jan 2022**	**0089_MW142_220110**	**Normal**	**EP2200214**	<0.05	<0.05	<0.02	<0.05	***6.00***	7.17	7.36	<1	434	<1	434	296	324	9,350	4.45	1,130		388		694		238		5,540
Demolition Ground	**MW142**	**15 Mar 2022**	**0089_MW142_220315**	**Normal**	**EP2203018**	<0.05	<0.05	<0.02	<0.05	***4.52***	6.15	6.30	<1	371	<1	371	342	365	10,800	3.17	1,450		404		836		320		6,150
Demolition Ground	**MW142**	**08 Jun 2022**	**0089_MW142_220608**	**Normal**	**EP2206969**	<0.05	<0.05	<0.02	<0.05	***3.87***	4.76	4.88	<1	297	<1	297	405	412	12,800	0.88	1,810		395		990		378		6,920
Demolition Ground	**MW142**	**05 Sep 2022**	**0089_MW142_220905**	**Normal**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	***9.41***	12.9	13.3	<1	347	<1	347	327	333	10,400	0.93	1,300		358		803		284		5,570
Demolition Ground	**MW142**	**12 Dec 2022**	**0089_MW142_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.02	<0.05	***7.72***	11.6	12.0	<1	410	<1	410	287	283	9,020	0.84	1,190		332		629		216		4,800
Demolition Ground	**MW142**	**15 Mar 2023**	**0089_MW142_230315**	**Normal**	**EP2303226**	<0.05	<0.05	<0.02	<0.05	***7.52***	11.7	12.1	<1	376	<1	376	335	380	10,500	6.21	1,510		367		807		302		6,600
Demolition Ground	**MW142**	**07 Jun 2023**	**0089_MW142_230607**	**Normal**	**EP2307497**	<0.05	<0.05	<0.02	<0.05	***5.98***	11.3	11.7	<1	329	<1	329	326	359	10,300	4.81	1,400		379		746		244		6,270
Demolition Ground	**MW142**	**11 Sep 2023**	**0089_MW142_230911**	**Normal**	**EP2312528**	<0.05	<0.05	<0.02	<0.05	***7.46***	11.4	11.8	<1	385	<1	385	352	372	11,100	2.80	1,490		384		843		340		6,320
Demolition Ground	**MW147**	**30 Oct 2010**	**C24-MB02**	**Normal**	**EP1005976**																							
Demolition Ground	**MW147**	**18 Oct 2013**	**QC37**	**Field Duplicate**	**EP1307981**																							
Demolition Ground	**MW147**	**18 Oct 2013**	**WA0006_C24_MB02**	**Normal**	**EP1307981**																							
Demolition Ground	**MW147**	**26 May 2015**	**C24_MB02**	**Normal**	**EP1510572**																							
Demolition Ground	**MW147**	**29 Sep 2015**	**C24_MB02**	**Normal**	**EP1514335**																							
Demolition Ground	**MW147**	**25 Oct 2016**	**C24_MB02**	**Normal**	**521581**																							
Demolition Ground	**MW147**	**01 Aug 2017**	**0089_MW147_S_170801**	**Normal**	**198918**	<0.005	<0.01	<0.002	<0.05					440					4,800	4.5			270		330		96		2,900
Demolition Ground	**MW147**	**19 Sep 2017**	**0089_MW147_D_170919**	**Normal**	**176140**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW147**	**19 Sep 2017**	**0089_MW147_S_170919**	**Normal**	**176140**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW147**	**17 Oct 2017**	**0089_MW147_D_171017**	**Normal**	**177985**	<0.005	<0.05	<0.002	<0.05																			
Demolition Ground	**MW147**	**17 Oct 2017**	**0089_MW147_S_171017**	**Normal**	**177985**	<0.005	<0.05	<0.002	<0.05																			
Demolition Ground	**MW147**	**20 Nov 2017**	**0089_MW147_D_171120**	**Normal**	**203545**	<0.005	<0.1	<0.002	<0.05																			
Demolition Ground	**MW147**	**20 Nov 2017**	**0089_MW147_S_171120**	**Normal**	**203545**	<0.005	<0.1	<0.002	<0.05																			
Demolition Ground	**MW147**	**04 Dec 2017**	**0089_MW147_D_171204**	**Normal**	**204124**	<0.005	<0.02	<0.002	<0.05																			
Demolition Ground	**MW147**	**04 Dec 2017**	**0089_MW147_S_171204**	**Normal**	**204124**	<0.005	<0.02	<0.002	<0.05																			
Demolition Ground	**MW147**	**17 Jan 2018**	**0089_MW147_D_1801117**	**Normal**	**205691**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW147**	**17 Jan 2018**	**0089_MW147_S_1801117**	**Normal**	**205691**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW147**	**01 Feb 2018**	**0089_MW147_D_180201**	**Normal**	**206292**	<0.005	<0.01	<0.002	<0.05					400					8,200	0.15			270		540		140		4,600
Demolition Ground	**MW147**	**01 Feb 2018**	**0089_MW147_I_180201**	**Normal**	**206292**	<0.005	<0.01	<0.002	<0.05					400					7,900	-0.43			260		530		140		4,300
Demolition Ground	**MW147**	**01 Feb 2018**	**0089_MW147_S_180201**	**Normal**	**206292**	<0.005	<0.01	<0.002	<0.05					440					4,100	-0.33			200		290		75		2,200
Demolition Ground	**MW147**	**20 Jul 2020**	**0089_MW147_200720**	**Normal**	**EP2007544**	<0.05	<0.05	<0.02	<0.05	*0.24*	0.38	0.38	<1	573	<1	573	239	262	7,420	4.60	874		337		575		202		4,430
Demolition Ground	**MW147**	**15 Mar 2023**	**0089_MW147_230315**	**Normal**	**EP2303226**	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	0.10	<1	454	<1	454	310	325	9,790	2.27	1,210		336		699		238		5,620
Demolition Ground	**MW147**	**07 Jun 2023**	**0089_MW147_230607**	**Normal**	**EP2307497**	<0.05	<0.05	<0.02	<0.05	*0.36*	0.46	0.46	<1	573	<1	573	213	222	6,610	2.14	706		372		450		124		3,750
Demolition Ground	**MW147**	**11 Sep 2023**	**0089_MW147_230911**	**Normal**	**EP2312528**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	463	<1	463	156	160	4,790	1.18	556		248		357		121		2,640
Demolition Ground	**MW149**	**01 Aug 2017**	**0089_MW149_S_170801**	**Normal**	**198918**	<0.005	<0.01	<0.002	<0.05					270					15,000	1.1			420		970		270		8,300
Demolition Ground	**MW149**	**19 Sep 2017**	**0089_MW149_D_170919**	**Normal**	**176140**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW149**	**19 Sep 2017**	**0089_MW149_S_170919**	**Normal**	**176140**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW149**	**17 Oct 2017**	**0089_MW149_D_171017**	**Normal**	**177985**	<0.005	<0.05	<0.002	<0.05																			
Demolition Ground	**MW149**	**17 Oct 2017**	**0089_MW149_S_171017**	**Normal**	**177985**	<0.005	<0.05	<0.002	<0.05																			
Demolition Ground	**MW149**	**20 Nov 2017**	**0089_MW149_D_171120**	**Normal**	**203545**	<0.005	<0.1	<0.002	<0.05																			
Demolition Ground	**MW149**	**20 Nov 2017**	**0089_MW149_S_171120**	**Normal**	**203545**	<0.005	<0.1	<0.002	<0.05																			
Demolition Ground	**MW149**	**04 Dec 2017**	**0089_MW149_D_171204**	**Normal**	**204124**	<0.005	<0.02	<0.002	<0.05																			
Demolition Ground	**MW149**	**04 Dec 2017**	**0089_MW149_S_171204**	**Normal**	**204124**	<0.005	<0.02	<0.002	<0.05																			
Demolition Ground	**MW149**	**17 Jan 2018**	**0089_MW149_D_1801117**	**Normal**	**205691**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW149**	**17 Jan 2018**	**0089_MW149_S_1801117**	**Normal**	**205691**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW149**	**17 Jan 2018**	**0089_QC1MW_S_1801117**	**Field Duplicate**	**205691**	<0.005	<0.01	<0.002	<0.05																			
Demolition Ground	**MW149**	**17 Jan 2018**	**0089_QC2MW_180117**	**Interlab Duplicate**	**580891**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
Demolition Ground	**MW149**	**17 Jan 2018**	**0089_QC2MW_180117**	**Interlab Duplicate**	**580891**	<0.05	<0.05	<0.05	<0.05																			
Demolition Ground	**MW149**	**01 Feb 2018**	**0089_MW149_D_180201**	**Normal**	**206292**	<0.005	<0.01	<0.002	<0.05					220					15,000	0.49			330		960		290		8,500
Demolition Ground	**MW149**	**01 Feb 2018**	**0089_MW149_I_180201**	**Normal**	**206292**	<0.005	<0.01	<0.002	<0.05					260					12,000	-0.79			290		790		250		6,800
Demolition Ground	**MW149**	**01 Feb 2018**	**0089_MW149_S_180201**	**Normal**	**206292**	<0.005	<0.01	<0.002	<0.05					360					7,400	2.3			210		510		150		4,500
Demolition Ground	**MW149**	**08 Jan 2020**	**0089_MW149_200108**	**Normal**	**EP2000179**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	393	<1	393	257	263	7,890	1.07	1,300		239		593		240		4,510
Demolition Ground	**MW149**	**30 Mar 2020**	**0089_MW149_200330**	**Normal**	**EP2003308**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	434	<1	434	320	341	10,000	3.24	1,400		335		821		323		5,720
Demolition Ground	**MW149**	**20 Jul 2020**	**0089_MW149_200720**	**Normal**	**EP2007544**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	203	<1	203	567	678	18,000	8.89	2,650		476		1,470		596		11,900
Demolition Ground	**MW149**	**23 Sep 2020**	**0089_MW149_200923**	**Normal**	**EP2010217**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	131	<1	131	595	637	18,900	3.39	2,840		463		1,450		616		11,000
Demolition Ground	**MW149**	**14 Dec 2020**	**0089_MW149_201214**	**Normal**	**EP2013983**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	136	<1	136	601	678	19,100	5.99	2,860		497		1,540		670		11,700
Demolition Ground	**MW149**	**16 Mar 2021**	**0089_MW149_210316**	**Normal**	**EP2102836**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	232	<1	232	610	659	19,400	3.85	2,810		498		1,480		653		11,400
Demolition Ground	**MW149**	**08 Jun 2021**	**0089_MW149_210608**	**Normal**	**EP2106464**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	350	<1	350	444	478	14,000	3.71	2,020		386		1,080		504		8,210
Demolition Ground	**MW149**	**08 Jun 2021**	**0089_QC105_210608**	**Field Duplicate**	**EP2106464**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	326	<1	326	546	612	17,300	5.72	2,460		481		1,380		519		10,600
Demolition Ground	**MW149**	**08 Jun 2021**	**0089_QC205_210608**	**Interlab Duplicate**	**802464**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	16	390					16,000			450		1,100		390		9,000	
Demolition Ground	**MW149**	**30 Aug 2021**	**0089_MW149_210830**	**Normal**	**EP2110016**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	518	565	16,500	4.34	2,380		404		1,270		518		9,810
Demolition Ground	**MW149**	**10 Jan 2022**	**0089_MW149_220110**	**Normal**	**EP2200214**	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	197	<1	197	372	366	11,800	0.80	1,700		298		799		336		6,370
Demolition Ground	**MW149**	**15 Mar 2022**	**0089_MW149_220315**	**Normal**	**EP2203018**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	180	<1	180	519	565	16,600	4.27	2,260								
Demolition Ground	**MW149**	**08 Jun 2022**	**0089_MW149_220608**	**Normal**	**EP2206969**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	200	<1	200	533	579	16,900	4.16	2,500		456		1,370		553		9,870
Demolition Ground	**MW149**	**05 Sep 2022**	**0089_MW149_220905**	**Normal**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	139	<1	139	517	509	16,500	0.80	2,350		397		1,230		453		8,650
Demolition Ground	**MW149**	**12 Dec 2022**	**0089_MW149_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	393	<1	393	224	199	6,870	6.03	1,090		197		452		169		3,390
Demolition Ground	**MW149**	**15 Mar 2023**	**0089_MW149_230315**	**Normal**	**EP2303226**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	200	<1	200	479	533	15,200	5.36	2,220		366		1,130		479		9,420
Demolition Ground	**MW149**	**07 Jun 2023**	**0089_MW149_230607**	**Normal**	**EP2307497**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	217	<1	217	481	533	15,200	5.16	2,300		464		1,100		337		9,450
Demolition Ground	**MW149**	**11 Sep 2023**	**0089_MW149_230911**	**Normal**	**EP2312528**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	220	<1	220	543	616	17,300	6.33	2,420		464		1,390		514		10,700
WWTP	**MW158**	**07 Aug 2017**	**0089_MW158_S_170807**	**Normal**	**199149**	<0.005	<0.01	<0.002	<0.05					450					4,600	1.1			210		330		84		2,600
WWTP	**MW158**	**08 Jan 2020**	**0089_MW158_200108**	**Normal**	**EP2000182**	<0.05	<0.05	<0.02	<0.05	0.02	0.17	0.17	<1	420	<1	420	144	154	4,480	3.27	465		241		389		124		2,460
WWTP	**MW158**	**31 Mar 2020**	**0089_MW158_200331**	**Normal**	**EP2003364**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	495	<1	495	147	151	4,520	1.32	462		222		374		116		2,440
WWTP	**MW158**	**21 Jul 2020**	**0089_MW158_200721**	**Normal**	**EP2007594**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	455	<1	455	135	129	4,120	2.47	483		203		327		103		2,050
WWTP	**MW158**	**21 Sep 2020**	**0089_MW158_200921**	**Normal**	**EP2010093**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	575	<1	575	145	141	4,390	1.42	482		197		342		111		2,310
WWTP	**MW158**	**14 Dec 2020**	**0089_MW158_201214**	**Normal**	**EP2013984**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	440	<1	440	154	138	4,750	5.38	526		191		338		110		2,250
WWTP	**MW158**	**15 Mar 2021**	**0089_MW158_210315**	**Normal**	**EP2102752**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	405	<1	405	143	146	4,390	0.95	524		202		343		112		2,400
WWTP	**MW158**	**10 Jun 2021**	**0089_MW158_210610**	**Normal**	**EP2106588**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	418	<1	418	152	144	4,700	2.41	508		204		348		113		2,360
WWTP	**MW158**	**30 Aug 2021**	**0089_MW158_210830**	**Normal**	**EP2110020**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	448	<1	448	124	151	3,720	9.81	486		206		354		111		2,500
WWTP	**MW158**	**30 Aug 2021**	**0089_QC110_210830**	**Field Duplicate**	**EP2110020**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	422	<1	422	123	150	3,720	9.87	478		207		356		111		2,480
WWTP	**MW158**	**30 Aug 2021**	**0089_QC210_210830**	**Interlab Duplicate**	**820919**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW158**	**15 Mar 2022**	**0089_MW158_220315**	**Normal**	**EP2203018**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	430	<1	430	143	153	4,410	3.26	494		221		367		116		2,500

Table 1 - Groundwater Analytical Results

						uoroalkyl Sulfonamides				PFAS			Inorganics									Metals								
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																			
PFAS NEMP 2020 Freshwater 99%																													
PFAS NEMP 2020 Recreational Water										**2**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
WWTP	**MW158**	**07 Jun 2022**	**0089_MW158_220607**	**Normal**	**EP2206883**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	459	<1	459	130	134	3,940	1.67	445		210		320		109		2,170
WWTP	**MW158**	**05 Sep 2022**	**0089_MW158_220905**	**Normal**	**EP2211340**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	443	<1	443	133	138	4,060	1.90	463		195		334		103		2,260
WWTP	**MW158**	**12 Dec 2022**	**0089_MW158_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	448	<1	448	144	134	4,430	3.63	493		190		320		100		2,200
WWTP	**MW158**	**13 Mar 2023**	**0089_MW158_230313**	**Normal**	**EP2303084**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	432	<1	432	142	136	4,380	2.19	467		188		321		101		2,240
WWTP	**MW158**	**06 Jun 2023**	**0089_MW158_230606**	**Normal**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	455	<1	455	150	160	4,600	3.17	530		202		347		108		2,720
WWTP	**MW158**	**04 Sep 2023**	**0089_MW158_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	434	<1	434	151	143	4,680	2.63	483		185		330		104		2,390
WWTP	**MW161**	**07 Aug 2017**	**0089_MW161_S_170807**	**Normal**	**199149**	<0.005	<0.01	<0.002	<0.05					390					1,100	0.39			150		86		41		610
WWTP	**MW161**	**18 Sep 2017**	**0089_MW161_S_170918**	**Normal**	**176030**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW161**	**19 Oct 2017**	**0089_MW161_S_171019**	**Normal**	**178275**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW161**	**15 Nov 2017**	**0089_MW161_S_171115**	**Normal**	**203378**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW161**	**07 Dec 2017**	**0089_MW161_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW161**	**16 Jan 2018**	**0089_MW161_S_180116**	**Normal**	**205631**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW161**	**08 Jan 2020**	**0089_MW161_200108**	**Normal**	**EP2000182**	<0.05	<0.05	<0.02	<0.05	***16.8***	18.0	18.2	<1	311	<1	311	30.4	32.2	672	2.94	249		125		87		36		411
WWTP	**MW161**	**01 Apr 2020**	**0089_MW161_200401**	**Normal**	**EP2003417**	<0.05	<0.05	<0.02	<0.05	***13.2***	14.3	14.7	<1	318	<1	318	33.1	34.3	777	1.75	233		132		96		40		432
WWTP	**MW161**	**21 Jul 2020**	**0089_MW161_200721**	**Normal**	**EP2007594**	<0.05	<0.05	<0.02	<0.05	***13.0***	14.3	14.8	<1	400	<1	400	30.3	29.9	673	0.63	158		86		98		34		383
WWTP	**MW161**	**21 Sep 2020**	**0089_MW161_200921**	**Normal**	**EP2010093**	<0.05	<0.05	<0.02	<0.05	***12.3***	13.2	13.5	<1	353	<1	353	32.1	34.4	721	3.44	226		126		96		38		442
WWTP	**MW161**	**14 Dec 2020**	**0089_MW161_201214**	**Normal**	**EP2013992**	<0.05	<0.05	<0.02	<0.05	***8.21***	8.77	8.97	<1	327	<1	327	32.9	30.6	774	3.53	217		119		76		36		403
WWTP	**MW161**	**15 Mar 2021**	**0089_MW161_210315**	**Normal**	**EP2102752**	<0.05	<0.05	<0.02	<0.05	***7.97***	8.54	8.72	<1	337	<1	337	32.6	30.5	779	3.30	188		78		81		38		437
WWTP	**MW161**	**10 Jun 2021**	**0089_MW161_210610**	**Normal**	**EP2106588**	<0.05	<0.05	<0.02	<0.05	***6.80***	7.50	7.68	<1	324	<1	324	32.1	33.8	792	2.69	156		139		79		39		446
WWTP	**MW161**	**30 Aug 2021**	**0089_MW161_210830**	**Normal**	**EP2110020**	<0.05	<0.05	<0.02	<0.05	***5.59***	6.15	6.25	<1	393	<1	393	32.5	32.6	762	0.18	152		122		89		37		420
WWTP	**MW161**	**10 Jan 2022**	**0089_MW161_220110**	**Normal**	**EP2200216**	<0.05	<0.05	<0.02	<0.05	***6.34***	7.11	7.33	<1	460	<1	460	30.6	25.2	654	9.69	145		84		82		32		310
WWTP	**MW161**	**15 Mar 2022**	**0089_MW161_220315**	**Normal**	**EP2203018**	<0.05	<0.05	<0.02	<0.05	***4.43***	5.02	5.11	<1	420	<1	420	32.7	33.9	742	1.74	164		122		105		42		416
WWTP	**MW161**	**07 Jun 2022**	**0089_MW161_220607**	**Normal**	**EP2206883**	<0.05	<0.05	<0.02	<0.05	***5.05***	5.66	5.83	<1	498	<1	498	32.4	29.9	670	3.99	169		93		98		39		372
WWTP	**MW161**	**05 Sep 2022**	**0089_MW161_220905**	**Normal**	**EP2211340**	<0.05	<0.05	<0.02	<0.05	***3.25***	3.46	3.49	<1	382	<1	382	32.7	29.5	755	5.21	181		87		71		36		422
WWTP	**MW161**	**12 Dec 2022**	**0089_MW161_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	***4.65***	4.91	4.94	<1	640	<1	640	34.8	27.9	609	11.0	230		65		67		35		419
WWTP	**MW161**	**13 Mar 2023**	**0089_MW161_230313**	**Normal**	**EP2303084**	<0.05	<0.05	<0.02	<0.05	***3.03***	3.15	3.18	<1	490	<1	490	31.3	27.1	600	7.19	219		68		69		34		394
WWTP	**MW161**	**06 Jun 2023**	**0089_MW161_230606**	**Normal**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	***2.46***	2.61	2.61	<1	376	<1	376	32.6	35.0	726	3.54	224		81		53		35		592
WWTP	**MW161**	**04 Sep 2023**	**0089_MW161_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	***2.89***	3.11	3.16	<1	376	<1	376	31.5	28.7	669	4.61	246		82		66		35		421
WWTP	**MW161**	**04 Sep 2023**	**0089_QC104_230904**	**Field Duplicate**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	***2.96***	3.19	3.22																	
WWTP	**MW161**	**04 Sep 2023**	**0089_QC204_230904**	**Interlab Duplicate**	**1023399**	<0.05	<0.05	<0.05	<0.05	***2.76***	2.99	3.04																	
WWTP	**MW166**	**07 Aug 2017**	**0089_MW166_S_170807**	**Normal**	**199149**	<0.005	<0.01	<0.002	<0.05					430					1,000	2.5			150		100		37		590
WWTP	**MW166**	**18 Sep 2017**	**0089_MW166_S_170918**	**Normal**	**176030**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW166**	**19 Oct 2017**	**0089_MW166_S_171019**	**Normal**	**178275**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW166**	**15 Nov 2017**	**0089_MW166_S_171115**	**Normal**	**203378**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW166**	**07 Dec 2017**	**0089_MW166_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW166**	**16 Jan 2018**	**0089_MW166_S_180116**	**Normal**	**205631**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW166**	**08 Jan 2020**	**0089_MW166_200108**	**Normal**	**EP2000182**	<0.05	<0.05	<0.02	<0.05	***9.67***	10.5	10.6	<1	539	<1	539	40.5	44.2	946	4.34	145		172		114		51		572
WWTP	**MW166**	**01 Apr 2020**	**0089_MW166_200401**	**Normal**	**EP2003417**	<0.05	<0.05	<0.02	<0.05	***15.9***	16.8	17.2	<1	542	<1	542	45.0	48.4	1,080	3.62	179		194		124		59		621
WWTP	**MW166**	**21 Jul 2020**	**0089_MW166_200721**	**Normal**	**EP2007594**	<0.05	<0.05	<0.02	<0.05	***16.0***	17.0	17.6	<1	590	<1	590	43.3	43.1	1,000	0.24	158		158		112		48		569
WWTP	**MW166**	**22 Sep 2020**	**0089_MW166_200922**	**Normal**	**EP2010151**	<0.05	<0.05	<0.02	<0.05	***9.36***	10.2	10.4	<1	518	<1	518	40.2	37.9	958	2.99	137		145		96		46		496
WWTP	**MW166**	**14 Dec 2020**	**0089_MW166_201214**	**Normal**	**EP2013984**	<0.05	<0.05	<0.02	<0.05	***8.00***	8.60	8.67	<1	394	<1	394	36.9	34.4	899	3.50	176		120		92		41		455
WWTP	**MW166**	**15 Mar 2021**	**0089_MW166_210315**	**Normal**	**EP2102752**	<0.05	<0.05	<0.02	<0.05	***9.14***	9.87	10.1	<1	388	<1	388	37.8	41.9	943	5.24	164		140		109		50		568
WWTP	**MW166**	**10 Jun 2021**	**0089_MW166_210610**	**Normal**	**EP2106588**	<0.05	<0.05	<0.02	<0.05	***10.8***	12.0	12.6	<1	515	<1	515	47.1	50.5	1,150	3.45	212		153		142		53		686
WWTP	**MW166**	**30 Aug 2021**	**0089_MW166_210830**	**Normal**	**EP2110019**	<0.05	<0.05	<0.02	<0.05	***9.11***	9.92	10.2	<1	363	<1	363	36.1	37.0	908	1.18	156		132		96		41		493
WWTP	**MW166**	**10 Jan 2022**	**0089_MW166_220110**	**Normal**	**EP2200211**	<0.05	<0.05	<0.02	<0.05	***8.03***	8.94	9.14	<1	366	<1	366	36.6	31.3	924	7.74	155		112		79		35		422
WWTP	**MW166**	**15 Mar 2022**	**0089_MW166_220315**	**Normal**	**EP2203018**	<0.05	<0.05	<0.02	<0.05	***7.81***	9.15	9.43	<1	413	<1	413	44.7	46.8	1,140	2.36	206		144		124		50		648
WWTP	**MW166**	**07 Jun 2022**	**0089_MW166_220607**	**Normal**	**EP2206883**	<0.05	<0.05	<0.02	<0.05	***8.67***	9.69	9.94	<1	388	<1	388	34.6	32.9	828	2.43	167		118		90		42		427
WWTP	**MW166**	**05 Sep 2022**	**0089_MW166_220905**	**Normal**	**EP2211340**	<0.05	<0.05	<0.02	<0.05	***6.70***	7.35	7.45	<1	360	<1	360	34.6	33.3	856	1.92	158		110		93		39		441
WWTP	**MW166**	**12 Dec 2022**	**0089_MW166_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	***8.96***	10.1	10.4	<1	399	<1	399	39.7	36.4	995	4.39	176		128		91		34		497
WWTP	**MW166**	**13 Mar 2023**	**0089_MW166_230313**	**Normal**	**EP2303084**	<0.05	<0.05	<0.02	<0.05	***4.71***	5.55	5.75	<1	353	<1	353	35.7	35.0	888	1.03	172		107		91		37		487
WWTP	**MW166**	**06 Jun 2023**	**0089_MW166_230606**	**Normal**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	***4.78***	5.54	5.71	<1	370	<1	370	34.6	38.3	848	5.06	158		100		84		35		586
WWTP	**MW166**	**04 Sep 2023**	**0089_MW166_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	***4.54***	5.32	5.49	<1	388	<1	388	36.9	35.4	909	2.07	167		110		97		40		480
WWTP	**MW171**	**07 Aug 2017**	**0089_MW171_S_170807**	**Normal**	**199149**	<0.005	<0.01	<0.002	<0.05					680					2,400	1.6			140		210		56		1,400
WWTP	**MW171**	**18 Sep 2017**	**0089_MW171_S_170918**	**Normal**	**176030**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW171**	**19 Oct 2017**	**0089_MW171_S_171019**	**Normal**	**178275**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW171**	**15 Nov 2017**	**0089_MW171_S_171115**	**Normal**	**203378**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW171**	**07 Dec 2017**	**0089_MW171_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW171**	**16 Jan 2018**	**0089_MW171_S_180116**	**Normal**	**205631**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW171**	**01 Apr 2020**	**0089_MW171_200401**	**Normal**	**EP2003417**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	450	<1	450	160	147	4,920	4.00	575		220		387		111		2,340
WWTP	**MW171**	**21 Jul 2020**	**0089_MW171_200721**	**Normal**	**EP2007594**	<0.05	<0.05	<0.02	<0.05	*0.55*	0.81	0.81	<1	304	<1	304	60.8	64.4	1,800	2.88	190		116		157		52		1,020
WWTP	**MW171**	**14 Dec 2020**	**0089_MW171_201214**	**Normal**	**EP2013992**	<0.05	<0.05	<0.02	<0.05	*0.08*	0.23	0.23	<1	326	<1	326	57.4	57.1	1,670	0.26	180		113		138		48		893
WWTP	**MW171**	**15 Mar 2021**	**0089_MW171_210315**	**Normal**	**EP2102752**	<0.05	<0.05	<0.02	<0.05	*0.18*	0.37	0.40	<1	358	<1	358	99.0	98.1	3,000	0.49	349		147		237		81		1,590
WWTP	**MW171**	**10 Jun 2021**	**0089_MW171_210610**	**Normal**	**EP2106588**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	429	<1	429	149	172	4,520	7.32	606		219		427		118		2,830
WWTP	**MW171**	**30 Aug 2021**	**0089_MW171_210830**	**Normal**	**EP2110019**	<0.05	<0.05	<0.02	<0.05	*0.35*	0.74	0.82	<1	452	<1	452	138	155	4,200	5.51	528		195		381		104		2,550
WWTP	**MW171**	**10 Jan 2022**	**0089_MW171_220110**	**Normal**	**EP2200216**	<0.05	<0.05	<0.02	<0.05	*0.18*	0.42	0.46	<1	463	<1	463	154	142	4,740	4.14	552		192		340		111		2,340
WWTP	**MW171**	**15 Mar 2022**	**0089_MW171_220315**	**Normal**	**EP2203018**	<0.05	<0.05	<0.02	<0.05	0.03	0.05	0.05	<1	447	<1	447	148	163	4,530	4.87	542		214		412		112		2,660
WWTP	**MW171**	**07 Jun 2022**	**0089_MW171_220607**	**Normal**	**EP2206883**	<0.05	<0.05	<0.02	<0.05	*0.27*	0.58	0.64	<1	485	<1	485	144	151	4,370	2.41	533		210		375		111		2,460
WWTP	**MW171**	**05 Sep 2022**	**0089_MW171_220905**	**Normal**	**EP2211340**	<0.05	<0.05	<0.02	<0.05	*0.08*	0.16	0.16	<1	466	<1	466	170	160	5,260	3.19	596		196		402		107		2,620
WWTP	**MW171**	**12 Dec 2022**	**0089_MW171_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	*0.34*	0.81	0.88	<1	492	<1	492	134	128	4,060	2.17	468		176		311		88		2,110
WWTP	**MW171**	**13 Mar 2023**	**0089_MW171_230313**	**Normal**	**EP2303084**	<0.05	<0.05	<0.02	<0.05	*0.22*	0.51	0.55	<1	465	<1	465	165	158	5,080	2.28	598		195		391		105		2,600
WWTP	**MW171**	**13 Mar 2023**	**0089_QC103_230313**	**Field Duplicate**	**EP2303084**	<0.05	<0.05	<0.02	<0.05	0.07	0.14	0.14	<1	465	<1	465	168	156	5,200	3.73	596		191		387		104		2,580
WWTP	**MW171**	**13 Mar 2023**	**0089_QC203_230313**	**Interlab Duplicate**	**972487**	<0.05	<0.05	<0.05	<0.05	0.05	0.11	0.13																	
WWTP	**MW171**	**06 Jun 2023**	**0089_MW171_230606**	**Normal**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	***6.12***	10.7	12.0	<1	512	<1	512	72.6	80.7	1,980	5.26	315		110		188		57		1,340
WWTP	**MW171**	**04 Sep 2023**	**0089_MW171_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	***5.80***	9.66	11.1	<1	498	<1	498	62.9	65.3	1,670	1.84	282		101		175		58		1,020
WWTP	**MW172**	**07 Aug 2017**	**0089_MW172_S_170807**	**Normal**	**199149**	<0.005	<0.01	<0.002	<0.05					480					5,000	2.2			230		380		94		2,900
WWTP	**MW172**	**08 Jun 2022**	**0089_MW172_220608**	**Normal**	**EP2206971**	<0.05	<0.05	<0.02	<0.05	***13.2***	20.4	23.4	<1	455	<1	455	47.3	55.2	1,190	7.75	222		119		153		64		806
WWTP	**MW172**	**06 Sep 2022**	**0089_MW172_220906**	**Normal**	**EP2211400**	<0.05	<0.05	<0.02	<0.05	***29.6***	35.4	39.0	<1	404	<1	404	43.6	42.0	1,110	1.90	203		99		117		48		602
WWTP	**MW172**	**12 Dec 2022**	**0089_MW172_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	***30.6***	37.9	41.7	<1	504	<1	504	50.9	48.6	1,300	2.27	198		108		129		45		723
WWTP	**MW172**	**13 Mar 2023**	**0089_MW172_230313**	**Normal**	**EP2303084**	<0.05	<0.05	<0.02	<0.05	***17.8***	22.9	25.7	<1	446	<1	446	52.5	50.3	1,360	2.10	251		98		130		51		769
WWTP	**MW172**	**06 Jun 2023**	**0089_MW172_230606**	**Normal**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	***15.8***	21.4	24.0	<1	442	<1	442	47.8	54.8	1,200	6.82	247		96		123		47		890
WWTP	**MW173**	**09 Aug 2017**	**0089_MW173_S_170809**	**Normal**	**199252**	<0.005	<0.01	<0.002	<0.05					490					2,500	5.8			230		190		46		1,500
WWTP	**MW173**	**18 Sep 2017**	**0089_MW173_S_170918**	**Normal**	**176030**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW173**	**19 Oct 2017**	**0089_MW173_S_171019**	**Normal**	**178275**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW173**	**15 Nov 2017**	**0089_MW173_S_171115**	**Normal**	**203378**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW173**	**07 Dec 2017**	**0089_MW173_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW173**	**16 Jan 2018**	**0089_MW173_S_180116**	**Normal**	**205631**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW173**	**16 Jan 2020**	**0089_MW173_200117**	**Normal**	**EP2000515**	<0.05	<0.05	<0.02	<0.05	*1.19*	2.71	3.05	<1	456	<1	456	73.1	71.1	2,130	1.35	187		196		171		63		1,050
WWTP	**MW173**	**31 Mar 2020**	**0089_MW173_200331**	**Normal**	**EP2003364**	<0.05	<0.05	<0.02	<0.05	***3.01***	5.70	7.05	<1	577	<1	577	70.9	72.9	1,930	1.33	239		176		178		79		1,090
WWTP	**MW173**	**22 Jul 2020**	**0089_MW173_200722**	**Normal**	**EP2007667**	<0.05	<0.05	<0.02	<0.05	***8.91***	13.7	15.6	<1	1,030	<1	1,030	65.5	67.9	1,380	1.83	286		162		178		79		992
WWTP	**MW173**	**16 Mar 2021**	**0089_MW173_210316**	**Normal**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	***7.99***	10.2	11.2	<1	583	<1	583	40.4	38.4	824	2.49	264		83		104		45		565
WWTP	**MW173**	**16 Mar 2021**	**0089_QC114_210316**	**Field Duplicate**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	***8.94***	11.1	12.2	<1	538	<1	538	39.6	38.8	830	1.06	263		86		106		44		567
WWTP	**MW173**	**16 Mar 2021**	**0089_QC214_210316**	**Interlab Duplicate**	**781350**	<0.05	<0.05	<0.05	<0.05	***9.6***	11.36	12.03	<10	590					830			84		98		34		550	

Table 1 - Groundwater Analytical Results

						uoroalkyl Sulfonamides				PFAS			Inorganics									Metals								
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																			
PFAS NEMP 2020 Freshwater 99%																													
PFAS NEMP 2020 Recreational Water										**2**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
WWTP	**MW173**	**10 Jun 2021**	**0089_MW173_210610**	**Normal**	**EP2106579**	<0.05	<0.05	<0.02	<0.05	***13.0***	16.1	17.7	<1	668	<1	668	40.3	39.5	813	1.02	194		82		126		54		544
WWTP	**MW173**	**15 Mar 2022**	**0089_MW173_220315**	**Normal**	**EP2203018**	<0.05	<0.05	<0.02	<0.05	***9.63***	11.7	12.5	<1	378	<1	378	42.5	42.6	1,040	0.09	269		110		98		46		640
WWTP	**MW173**	**08 Jun 2022**	**0089_MW173_220608**	**Normal**	**EP2206969**	<0.05	<0.05	<0.02	<0.05	***13.2***	14.7	15.7	<1	464	<1	464	34.5	34.6	803	0.09	126		129		105		34		429
WWTP	**MW173**	**05 Sep 2022**	**0089_MW173_220905**	**Normal**	**EP2211340**	<0.05	<0.05	<0.02	<0.05	***9.20***	10.5	11.2	<1	460	<1	460	44.1	42.0	1,040	2.44	267		104		93		46		643
WWTP	**MW173**	**12 Dec 2022**	**0089_MW173_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	***9.64***	10.9	11.5	<1	447	<1	447	34.6	30.6	822	6.11	117		127		83		24		386
WWTP	**MW173**	**13 Mar 2023**	**0089_MW173_230313**	**Normal**	**EP2303084**	<0.05	<0.05	<0.02	<0.05	***6.44***	7.30	7.79	<1	393	<1	393	36.6	33.9	930	3.83	122		125		89		24		454
WWTP	**MW173**	**06 Jun 2023**	**0089_MW173_230606**	**Normal**	**EP2307415**	<0.05	<0.05	<0.02	<0.05	***5.92***	6.69	7.14	<1	420	<1	420	33.5	37.6	821	5.76	96		134		90		23		528
WWTP	**MW173**	**04 Sep 2023**	**0089_MW173_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	***4.27***	4.87	5.28	<1	485	<1	485	31.5	29.9	729	2.58	58		138		87		22		351
WWTP	**MW193**	**08 Aug 2017**	**0089_MW193_S_170808**	**Normal**	**199212**	<0.005	<0.01	<0.002	<0.05					470					1,100	-1.9			140		87		25		600
WWTP	**MW193**	**18 Sep 2017**	**0089_MW193_S_170918**	**Normal**	**176030**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW193**	**19 Oct 2017**	**0089_MW193_S_171019**	**Normal**	**178275**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW193**	**15 Nov 2017**	**0089_MW193_S_171115**	**Normal**	**203378**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW193**	**07 Dec 2017**	**0089_MW193_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW193**	**16 Jan 2018**	**0089_MW193_S_180116**	**Normal**	**205631**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW193**	**08 Jan 2020**	**0089_MW193_200108**	**Normal**	**EP2000186**	<0.05	<0.05	<0.02	<0.05	***9.21***	13.3	14.5	<1	546	<1	546	39.4	38.3	813	1.35	266		171		105		28		470
WWTP	**MW193**	**31 Mar 2020**	**0089_MW193_200331**	**Normal**	**EP2003374**	<0.05	<0.05	<0.02	<0.05	***21.7***	27.9	30.0	<1	686	<1	686	45.8	43.7	1,030	2.37	146		133		128		38		587
WWTP	**MW193**	**15 Jul 2020**	**0089_MW193_200715**	**Normal**	**EP2007385**	<0.05	<0.05	<0.02	<0.05	***13.3***	18.4	20.5	<1	669	<1	669	33.8	32.8	676	1.44	64		146		100		30		380
WWTP	**MW193**	**16 Dec 2020**	**0089_MW193_201216**	**Normal**	**EP2014087**	<0.05	<0.05	<0.02	<0.05	***8.43***	11.5	12.4	<1	484	<1	484	33.7	33.4	692	0.47	218		158		95		31		389
WWTP	**MW193**	**16 Mar 2021**	**0089_MW193_210316**	**Normal**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	***12.1***	17.4	19.4	<1	629	<1	629	38.9	37.5	852	1.81	111		116		118		33		487
WWTP	**MW193**	**10 Jun 2021**	**0089_MW193_210610**	**Normal**	**EP2106580**	<0.05	<0.05	<0.02	<0.05	***10.1***	14.2	15.7	<1	492	<1	492	35.9	37.1	843	1.58	111		123		111		36		480
WWTP	**MW193**	**30 Aug 2021**	**0089_MW193_210830**	**Normal**	**EP2110020**	<0.05	<0.05	<0.02	<0.05	***13.4***	18.4	20.5	<1	424	<1	424	30.0	28.0	679	3.50	115		119		73		27		353
WWTP	**MW193**	**30 Aug 2021**	**0089_QC113_210830**	**Field Duplicate**	**EP2110020**	<0.05	<0.05	<0.02	<0.05	***11.9***	16.8	18.9	<1	410	<1	410	29.0	27.6	653	2.46	115		120		72		27		345
WWTP	**MW193**	**30 Aug 2021**	**0089_QC213_210830**	**Interlab Duplicate**	**820919**	<0.05	<0.05	<0.1	<0.05	***13***	18.26	20.42																	
WWTP	**MW193**	**10 Jan 2022**	**0089_MW193_220110**	**Normal**	**EP2200211**	<0.05	<0.05	<0.02	<0.05	***6.60***	9.16	9.86	<1	493	<1	493	26.8	23.0	538	7.68	84		104		70		22		263
WWTP	**MW193**	**15 Mar 2022**	**0089_MW193_220315**	**Normal**	**EP2203018**	<0.05	<0.05	<0.02	<0.05	***13.8***	19.7	21.6	<1	492	<1	492	37.4	37.2	829	0.30	203		132		118		34		461
WWTP	**MW193**	**07 Jun 2022**	**0089_MW193_220607**	**Normal**	**EP2206883**	<0.05	<0.05	<0.02	<0.05	***9.90***	13.3	14.5	<1	651	<1	651	29.3	26.5	538	5.03	56		111		98		26		282
WWTP	**MW193**	**05 Sep 2022**	**0089_MW193_220905**	**Normal**	**EP2211340**	<0.05	<0.05	<0.02	<0.05	***12.9***	16.2	17.8	<1	486	<1	486	29.5	26.2	656	5.94	61		107		76		26		320
WWTP	**MW193**	**12 Dec 2022**	**0089_MW193_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	***6.15***	7.92	8.65	<1	629	<1	629	25.3	19.6	389	12.7	86		105		59		14		211
WWTP	**MW193**	**13 Mar 2023**	**0089_MW193_230313**	**Normal**	**EP2303084**	<0.05	<0.05	<0.02	<0.05	***8.20***	10.6	11.6	<1	670	<1	670	36.5	30.2	693	9.50	172		92		98		22		390
WWTP	**MW193**	**06 Jun 2023**	**0089_MW193_230606**	**Normal**	**EP2307415**	<0.05	<0.05	<0.02	<0.05	***6.01***	7.51	8.20	<1	746	<1	746	32.2	27.8	534	7.38	108		93		80		15		372
WWTP	**MW193**	**04 Sep 2023**	**0089_MW193_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	***3.59***	4.42	4.84	<1	410	<1	410	21.4	18.5	380	7.16	120		112		55		10		188
WWTP	**MW195D**	**08 Aug 2017**	**0089_MW195_D_170808**	**Normal**	**199212**	<0.005	<0.01	<0.002	<0.05					370					10,000	0.39			350		700		190		5,900
WWTP	**MW195D**	**08 Aug 2017**	**0089_QC1MW_S_170808**	**Field Duplicate**	**199212**	<0.005	<0.01	<0.002	<0.05					320					10,000	2.6			350		700		190		6,100
WWTP	**MW195D**	**08 Aug 2017**	**0089_QC2MW_170808**	**Interlab Duplicate**	**558019**	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1	<10	300					12,000			360		710		180		5,400	
WWTP	**MW195D**	**08 Jan 2020**	**0089_MW195-D_200108**	**Normal**	**EP2000186**	<0.05	<0.05	<0.02	<0.05	0.02	11.4	11.4	<1	253	<1	253	195	192	6,080	0.95	906		258		459		159		3,150
WWTP	**MW195D**	**31 Mar 2020**	**0089_MW195_D_200331**	**Normal**	**EP2003364**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	158	<1	158	342	369	10,800	3.71	1,660		434		917		315		6,060
WWTP	**MW195D**	**15 Jul 2020**	**0089_MW195_D_200715**	**Normal**	**EP2007385**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	157	<1	157	404	438	12,900	4.05	1,770		465		967		368		7,490
WWTP	**MW195D**	**21 Sep 2020**	**0089_MW195-D_200921**	**Normal**	**EP2010093**	<0.05	<0.05	<0.02	<0.05	0.01	1.57	1.57	<1	162	<1	162	380	390	12,000	1.32	1,840		421		923		344		6,540
WWTP	**MW195D**	**16 Dec 2020**	**0089_MW195D_201216**	**Normal**	**EP2014087**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	193	<1	193	363	396	11,500	4.43	1,660		448		949		349		6,600
WWTP	**MW195D**	**16 Mar 2021**	**0089_MW195D_210316**	**Normal**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	146	<1	146	418	436	13,500	2.11	1,670		461		1,000		383		7,390
WWTP	**MW195D**	**16 Mar 2021**	**0089_QC115_210316**	**Field Duplicate**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	0.01	0.97	0.97	<1	242	<1	242	251	242	7,980	1.86	1,020		310		574		208		4,000
WWTP	**MW195D**	**16 Mar 2021**	**0089_QC215_210316**	**Interlab Duplicate**	**781350**	<0.05	<0.05	<0.05	<0.05	0.01	0.65	0.65	<10	290					12,000			350		590		150		4,300	
WWTP	**MW195D**	**08 Jun 2021**	**0089_QC212_210609**	**Interlab Duplicate**	**802464**	<0.05	<0.05	<0.05	<0.05	<0.01	1.45	1.45	30	330					10,000			420		780		230		6,200	
WWTP	**MW195D**	**09 Jun 2021**	**0089_MW195D_210609**	**Normal**	**EP2106514**	<0.05	<0.05	<0.02	<0.05	0.02	2.30	2.30	<1	224	<1	224	281	305	8,930	4.08	1,180		365		719		253		5,080
WWTP	**MW195D**	**09 Jun 2021**	**0089_QC112_210609**	**Field Duplicate**	**EP2106514**	<0.05	<0.05	<0.02	<0.05	0.02	2.86	2.86	<1	220	<1	220	283	312	9,000	4.75	1,200		371		731		260		5,200
WWTP	**MW195D**	**30 Aug 2021**	**0089_MW195D_210830**	**Normal**	**EP2110020**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	170	<1	170	312	341	9,860	4.44	1,480		365		785		297		5,770
WWTP	**MW195D**	**30 Aug 2021**	**0089_QC111_210830**	**Field Duplicate**	**EP2110020**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	182	<1	182	303	332	9,580	4.51	1,420		356		764		292		5,610
WWTP	**MW195D**	**30 Aug 2021**	**0089_QC211_210830**	**Interlab Duplicate**	**820919**	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1																	
WWTP	**MW195D**	**10 Jan 2022**	**0089_MW195D_220110**	**Normal**	**EP2200216**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	172	<1	172	363	327	11,600	5.28	1,560		379		752		261		5,500
WWTP	**MW195D**	**15 Mar 2022**	**0089_MW195D_220315**	**Normal**	**EP2203018**	<0.05	<0.05	<0.02	<0.05	0.02	0.14	0.14	<1	182	<1	182	322	336	10,200	2.14	1,480		389		814		279		5,580
WWTP	**MW195D**	**07 Jun 2022**	**0089_MW195D_220607**	**Normal**	**EP2206883**	<0.05	<0.05	<0.02	<0.05	0.03	0.26	0.26	<1	168	<1	168	398	369	12,700	3.76	1,730		440		874		340		6,120
WWTP	**MW195D**	**05 Sep 2022**	**0089_MW195D_220905**	**Normal**	**EP2211340**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	167	<1	167	338	351	10,800	1.76	1,470		385		834		261		5,890
WWTP	**MW195D**	**12 Dec 2022**	**0089_MW195D_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	241	<1	241	326	326	10,200	0.06	1,600		353		739		250		5,550
WWTP	**MW195D**	**12 Dec 2022**	**0089_QC111_221212**	**Field Duplicate**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	248	<1	248	305	344	9,460	5.98	1,610		374		781		264		5,850
WWTP	**MW195D**	**12 Dec 2022**	**0089_QC211_221212**	**Interlab Duplicate**	**950091**	<0.05	<0.05	<0.05	<0.05	0.01	<0.05	<0.1																	
WWTP	**MW195D**	**13 Mar 2023**	**0089_MW195D_230313**	**Normal**	**EP2303084**	<0.05	<0.05	<0.02	<0.05	0.03	0.28	0.28	<1	281	<1	281	268	239	8,390	5.65	1,220		302		538		189		4,020
WWTP	**MW195D**	**06 Jun 2023**	**0089_MW195D_230606**	**Normal**	**EP2307415**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	166	<1	166	367	417	11,600	6.37	1,760		389		819		262		7,440
WWTP	**MW195D**	**04 Sep 2023**	**0089_MW195D_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	319	<1	319	256	262	7,890	1.06	1,300		316		639		222		4,310
WWTP	**MW195D**	**04 Sep 2023**	**0089_QC105_230904**	**Field Duplicate**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
WWTP	**MW195D**	**04 Sep 2023**	**0089_QC205_230904**	**Interlab Duplicate**	**1023399**	<0.05	<0.05	<0.05	<0.05	0.01	<0.05	<0.1																	
WWTP	**MW195S**	**08 Aug 2017**	**0089_MW195_S_170808**	**Normal**	**199212**	<0.005	<0.01	<0.002	<0.05					420					360	0.68			140		51		11		210
WWTP	**MW195S**	**18 Sep 2017**	**0089_MW195_S_170918**	**Normal**	**176030**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW195S**	**18 Sep 2017**	**0089_QC1MW_170918**	**Field Duplicate**	**176030**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW195S**	**18 Sep 2017**	**0089_QC2MW_170918**	**Interlab Duplicate**	**564343**	<0.05	<0.05	<0.05	<0.05	***5.2***	5.25	5.34																	
WWTP	**MW195S**	**19 Oct 2017**	**0089_MW195_S_171019**	**Normal**	**178275**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW195S**	**19 Oct 2017**	**0089_QC1MW_171019**	**Field Duplicate**	**178275**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW195S**	**19 Oct 2017**	**0089_QC2MW_171019**	**Interlab Duplicate**	**568924**	<0.05	<0.05	<0.05	<0.05	0.05	0.2	0.23																	
WWTP	**MW195S**	**15 Nov 2017**	**0089_MW195_S_171115**	**Normal**	**203378**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW195S**	**15 Nov 2017**	**0089_QC1MW_171115**	**Field Duplicate**	**203378**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW195S**	**15 Nov 2017**	**0089_QC2MW_171115**	**Interlab Duplicate**	**573296**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW195S**	**07 Dec 2017**	**0089_MW195_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW195S**	**07 Dec 2017**	**0089_QC1MW_171207**	**Field Duplicate**	**204323**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW195S**	**07 Dec 2017**	**0089_QC2MW_171207**	**Interlab Duplicate**	**576599**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW195S**	**16 Jan 2018**	**0089_MW195_S_180116**	**Normal**	**205631**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW195S**	**16 Jan 2018**	**0089_QC1MW_180116**	**Field Duplicate**	**205631**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW195S**	**16 Jan 2018**	**0089_QC2MW_180116**	**Interlab Duplicate**	**580891**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW195S**	**08 Jan 2020**	**0089_MW195-S_200108**	**Normal**	**EP2000186**	<0.05	<0.05	<0.02	<0.05	<0.01	0.22	0.22	<1	559	<1	559	48.8	48.0	1,110	0.80	304		144		142		50		641
WWTP	**MW195S**	**08 Jan 2020**	**0089_QC102_200108**	**Field Duplicate**	**EP2000186**	<0.05	<0.05	<0.02	<0.05	<0.01	0.11	0.11	<1	554	<1	554	47.9	47.0	1,060	1.03	335		138		139		50		629
WWTP	**MW195S**	**08 Jan 2020**	**0089_QC202_200108**	**Interlab Duplicate**	**696100**	<0.05	<0.05	<0.05	<0.05	<0.01	0.15	0.15	<10	670					1,300			140		120		35		590	
WWTP	**MW195S**	**31 Mar 2020**	**0089_MW195_S_200331**	**Normal**	**EP2003364**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	550	<1	550	47.6	47.8	1,090	0.13	283		163		144		50		609
WWTP	**MW195S**	**15 Jul 2020**	**0089_MW195_S_200715**	**Normal**	**EP2007385**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	603	<1	603	53.8	57.6	1,250	3.40	310		194		159		54		768
WWTP	**MW195S**	**21 Sep 2020**	**0089_MW195-S_200921**	**Normal**	**EP2010093**	<0.05	<0.05	<0.02	<0.05	<0.01	0.01	0.01	<1	596	<1	596	52.0	55.9	1,150	3.62	369		178		167		56		733
WWTP	**MW195S**	**21 Sep 2020**	**0089_QC108_200921**	**Field Duplicate**	**EP2010093**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	585	<1	585	63.3	72.7	1,520	6.93	419		204		199		70		1,020
WWTP	**MW195S**	**21 Sep 2020**	**0089_QC208_200921**	**Interlab Duplicate**	**746269**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	2,300	<20	2,300			1,400			200		150		42		870	
WWTP	**MW195S**	**16 Dec 2020**	**0089_MW195S_201216**	**Normal**	**EP2014087**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	575	<1	575	51.0	51.8	1,140	0.74	356		181		157		54		655
WWTP	**MW195S**	**16 Mar 2021**	**0089_MW195S_210316**	**Normal**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	557	<1	557	50.7	51.7	1,160	0.96	328		186		155		53		650
WWTP	**MW195S**	**09 Jun 2021**	**0089_MW195S_210609**	**Normal**	**EP2106514**	<0.05	<0.05	<0.02	<0.05	0.01	0.02	0.02	<1	570	<1	570	51.5	53.9	1,170	2.26	343		197		160		54		679
WWTP	**MW195S**	**30 Aug 2021**	**0089_MW195S_210830**	**Normal**	**EP2110020**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	582	<1	582	56.6	58.6	1,340	1.73	344		203		167		56		765
WWTP	**MW195S**	**10 Jan 2022**	**0089_MW195S_220110**	**Normal**	**EP2200216**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	595	<1	595	48.7	42.5	1,090	6.82	292		176		127		42		510
WWTP	**MW195S**	**10 Jan 2022**	**0089_QC106_220110**	**Field Duplicate**	**EP2200216**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
WWTP	**MW195S**	**10 Jan 2022**	**0089_QC206_220110**	**Interlab Duplicate**	**854607**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW195S**	**15 Mar 2022**	**0089_MW195S_220315**	**Normal**	**EP2203018**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	574	<1	574	47.2	47.4	1,040	0.13	309		198		147		47		556

Table 1 - Groundwater Analytical Results

						uoroalkyl Sulfonamides				PFAS			Inorganics								Metals							
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																			
PFAS NEMP 2020 Freshwater 99%																													
PFAS NEMP 2020 Recreational Water										**2**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
WWTP	**MW195S**	**15 Mar 2022**	**0089_QC111_220315**	**Field Duplicate**	**EP2203018**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
WWTP	**MW195S**	**15 Mar 2022**	**0089_QC211_220315**	**Interlab Duplicate**	**872903**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW195S**	**07 Jun 2022**	**0089_MW195S_220607**	**Normal**	**EP2206883**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	612	<1	612	48.0	45.4	1,040	2.81	311		179		137		50		550
WWTP	**MW195S**	**07 Jun 2022**	**0089_QC111_220607**	**Field Duplicate**	**EP2206883**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
WWTP	**MW195S**	**07 Jun 2022**	**0089_QC211_220607**	**Interlab Duplicate**	**896805**	<0.008	<0.004	<0.004	<0.008	0.019	0.033	0.035																	
WWTP	**MW195S**	**05 Sep 2022**	**0089_MW195S_220905**	**Normal**	**EP2211340**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	598	<1	598	46.0	43.3	998	2.96	282		177		132		43		518
WWTP	**MW195S**	**12 Dec 2022**	**0089_MW195S_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	576	<1	576	43.6	40.2	928	3.97	282		166		119		38		487
WWTP	**MW195S**	**13 Mar 2023**	**0089_MW195S_230313**	**Normal**	**EP2303084**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	618	<1	618	42.4	37.8	868	5.63	266		149		113		35		465
WWTP	**MW195S**	**13 Mar 2023**	**0089_QC113_230313**	**Field Duplicate**	**EP2303084**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	713	<1	713	45.9	39.0	920	8.15	273		150		115		36		485
WWTP	**MW195S**	**13 Mar 2023**	**0089_QC213_230313**	**Interlab Duplicate**	**972487**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW195S**	**06 Jun 2023**	**0089_MW195S_230606**	**Normal**	**EP2307415**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	587	<1	587	42.9	45.3	900	2.74	279		164		113		35		620
WWTP	**MW195S**	**06 Jun 2023**	**0089_QC109_230606**	**Field Duplicate**	**EP2307415**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	588	<1	588	43.1	45.3	904	2.51	280		164		114		35		617
WWTP	**MW195S**	**06 Jun 2023**	**0089_QC209_230606**	**Interlab Duplicate**	**997465**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW196**	**08 Aug 2017**	**0089_MW196_S_170808**	**Normal**	**199212**	<0.005	<0.01	<0.002	<0.05					240					37	5.5			84		21		1.9		24
WWTP	**MW196**	**02 Apr 2020**	**0089_MW196_200402**	**Normal**	**EP2003472**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	218	<1	218	5.91	7.21	36	9.92	26		84		21		3		28
WWTP	**MW196**	**22 Jul 2020**	**0089_MW196_200722**	**Normal**	**EP2007667**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	223	<1	223	6.44	7.26	51	6.06	26		73		23		3		38
WWTP	**MW196**	**24 Sep 2020**	**0089_MW196_200924**	**Normal**	**EP2010271**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	221	<1	221	5.94	6.29	35	2.83	26		68		20		3		27
WWTP	**MW196**	**16 Dec 2020**	**0089_MW196_201216**	**Normal**	**EP2014087**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	261	<1	261	6.67	6.95	33	2.10	25		81		21		2		26
WWTP	**MW196**	**16 Dec 2020**	**0089_QC116_201216**	**Field Duplicate**	**EP2014087**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	229	<1	229	5.94	6.84	32	7.04	22		77		22		2		26
WWTP	**MW196**	**16 Dec 2020**	**0089_QC216_201116**	**Interlab Duplicate**	**765054**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	450	<20	450			74			73		30		<5		36	
WWTP	**MW196**	**10 Jun 2021**	**0089_MW196_210610**	**Normal**	**EP2106579**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	210	<1	210	5.54	6.53	32	8.27	21		72		20		3		28
WWTP	**MW196**	**30 Aug 2021**	**0089_MW196_210830**	**Normal**	**EP2110019**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	219	<1	219	5.78	6.38	32	4.98	24		73		20		2		24
WWTP	**MW196**	**30 Aug 2021**	**0089_QC112_210830**	**Field Duplicate**	**EP2110019**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	212	<1	212	5.54	6.23	30	5.90	22		70		20		2		24
WWTP	**MW196**	**30 Aug 2021**	**0089_QC212_210830**	**Interlab Duplicate**	**820919**	<0.05	<0.05	<0.1	<0.05	<0.01	<0.1	<0.1																	
WWTP	**MW196**	**13 Jan 2022**	**0089_MW196_220113**	**Normal**	**EP2200340**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	207	<1	207	5.41	5.26	32	1.46	18		58		17		2		21
WWTP	**MW196**	**14 Mar 2022**	**0089_MW196_220314**	**Normal**	**EP2202975**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	226	<1	226	5.93	6.53	31	4.83	26		76		20		2		24
WWTP	**MW196**	**14 Mar 2022**	**0089_QC108_220314**	**Field Duplicate**	**EP2202975**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
WWTP	**MW196**	**14 Mar 2022**	**0089_QC208_220314**	**Interlab Duplicate**	**872911**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW196**	**06 Sep 2022**	**0089_MW196_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	229	<1	229	5.93	5.91	31	0.17	23		66		19		2		23
WWTP	**MW196**	**13 Dec 2022**	**0089_MW196_221213**	**Normal**	**EP2216929**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	225	<1	225	5.86	6.05	33	1.58	21		68		19		2		24
WWTP	**MW196**	**13 Mar 2023**	**0089_MW196_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	219	<1	219	5.81	5.56	36	2.18	20		59		19		2		23
WWTP	**MW196**	**06 Jun 2023**	**0089_MW196_230606**	**Normal**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	214	<1	214	5.69	4.99	36	6.51	19		55		14		2		24
WWTP	**MW197**	**09 Aug 2017**	**0089_MW197_S_170809**	**Normal**	**199252**	<0.005	<0.01	<0.002	<0.05					660					2,400	4.1			100		220		54		1,600
WWTP	**MW197**	**18 Sep 2017**	**0089_MW197_S_170918**	**Normal**	**176030**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW197**	**19 Oct 2017**	**0089_MW197_S_171019**	**Normal**	**178275**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW197**	**15 Nov 2017**	**0089_MW197_S_171115**	**Normal**	**203378**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW197**	**07 Dec 2017**	**0089_MW197_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW197**	**16 Jan 2018**	**0089_MW197_S_180116**	**Normal**	**205631**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW197**	**31 Mar 2020**	**0089_MW197_200331**	**Normal**	**EP2003374**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	416	<1	416	42.9	44.7	1,140	2.12	116		84		126		44		668
WWTP	**MW197**	**15 Jul 2020**	**0089_MW197_200715**	**Normal**	**EP2007382**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	441	<1	441	47.9	46.7	1,290	1.26	129		74		126		43		725
WWTP	**MW197**	**16 Mar 2021**	**0089_MW197_210316**	**Normal**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	454	<1	454	62.5	65.1	1,760	2.01	182		90		184		59		1,010
WWTP	**MW197**	**09 Jun 2021**	**0089_MW197_210609**	**Normal**	**EP2106514**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	506	<1	506	56.8	58.3	1,540	1.28	158		80		170		55		895
WWTP	**MW197**	**01 Sep 2021**	**0089_MW197_210901**	**Normal**	**EP2110159**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	1,140	<1	1,140	72.7	70.6	1,490	1.44	378		67		324		91		880
WWTP	**MW197**	**07 Jun 2022**	**0089_MW197_220607**	**Normal**	**EP2206883**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	441	<1	441	44.8	42.3	1,190	2.96	119		78		131		42		610
WWTP	**MW197**	**05 Sep 2022**	**0089_MW197_220905**	**Normal**	**EP2211340**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	701	<1	701	42.2	39.8	868	2.87	177		63		200		32		446
WWTP	**MW197**	**12 Dec 2022**	**0089_MW197_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	574	<1	574	30.9	29.8	592	1.90	132		54		133		25		356
WWTP	**MW197**	**12 Dec 2022**	**0089_QC115_221212**	**Field Duplicate**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	566	<1	566	32.3	28.8	641	5.61	138		53		130		24		342
WWTP	**MW197**	**12 Dec 2022**	**0089_QC215_221212**	**Interlab Duplicate**	**950091**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW197**	**14 Mar 2023**	**0089_MW197_230314**	**Normal**	**EP2303177**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	437	<1	437	31.9	30.2	744	2.73	107		54		110		26		410
WWTP	**MW197**	**07 Jun 2023**	**0089_MW197_230607**	**Normal**	**EP2307555**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	537	<1	537	84.9	98.2	2,440	7.26	258		116		124		69		1,850
WWTP	**MW199**	**08 Aug 2017**	**0089_MW199_S_170808**	**Normal**	**199212**	<0.005	<0.01	<0.002	<0.05					400					8,100	4.8			290		590		130		5,000
WWTP	**MW199**	**18 Sep 2017**	**0089_MW199_S_170918**	**Normal**	**176030**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW199**	**19 Oct 2017**	**0089_MW199_S_171019**	**Normal**	**178275**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW199**	**15 Nov 2017**	**0089_MW199_S_171115**	**Normal**	**203378**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW199**	**07 Dec 2017**	**0089_MW199_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW199**	**16 Jan 2018**	**0089_MW199_S_180116**	**Normal**	**205631**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW199**	**08 Jan 2020**	**0089_MW199_200108**	**Normal**	**EP2000186**	<0.05	<0.05	<0.02	<0.05	0.04	0.12	0.12	<1	366	<1	366	35.8	34.9	928	1.32	111		76		80		29		546
WWTP	**MW199**	**31 Mar 2020**	**0089_MW199_200331**	**Normal**	**EP2003364**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	863	<1	863	227	244	7,030	3.54	573		325		622		193		3,950
WWTP	**MW199**	**15 Jul 2020**	**0089_MW199_200715**	**Normal**	**EP2007385**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	506	<1	506	36.2	35.5	856	0.98	92		87		80		26		549
WWTP	**MW199**	**21 Sep 2020**	**0089_MW199_200921**	**Normal**	**EP2010093**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	797	<1	797	225	228	6,940	0.66	644		288		542		217		3,760
WWTP	**MW199**	**16 Dec 2020**	**0089_MW199_201216**	**Normal**	**EP2014087**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	368	<1	368	34.0	35.4	865	2.01	107		97		102		29		492
WWTP	**MW199**	**30 Aug 2021**	**0089_MW199_210830**	**Normal**	**EP2110019**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	345	<1	345	14.4	13.6	221	2.77	59		70		46		10		139
WWTP	**MW199**	**10 Jan 2022**	**0089_MW199_220110**	**Normal**	**EP2200216**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	396	<1	396	72.2	67.3	2,110	3.54	229		106		139		54		1,130
WWTP	**MW199**	**17 Mar 2022**	**0089_MW199_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	441	<1	441	128	136	3,880	3.00	464		173		291		108		2,310
WWTP	**MW199**	**07 Jun 2022**	**0089_MW199_220607**	**Normal**	**EP2206883**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	462	<1	462	79.1	72.6	2,300	4.27	238		115		146		69		1,220
WWTP	**MW199**	**07 Jun 2022**	**0089_QC109_220607**	**Field Duplicate**	**EP2206883**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
WWTP	**MW199**	**07 Jun 2022**	**0089_QC209_220607**	**Interlab Duplicate**	**896805**	<0.008	<0.004	<0.004	<0.008	0.005	0.005	0.005																	
WWTP	**MW199**	**05 Sep 2022**	**0089_MW199_220905**	**Normal**	**EP2211340**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	349	<1	349	22.5	19.6	495	6.95	75		94		47		14		245
WWTP	**MW199**	**05 Sep 2022**	**0089_QC111_220905**	**Field Duplicate**	**EP2211340**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	357	<1	357	29.3	25.7	715	6.44	95		96		61		19		355
WWTP	**MW199**	**05 Sep 2022**	**0089_QC211_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW199**	**12 Dec 2022**	**0089_MW199_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	461	<1	461	53.8	49.1	1,450	4.61	179		81		97		36		831
WWTP	**MW199**	**12 Dec 2022**	**0089_QC108_221212**	**Field Duplicate**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	465	<1	465	63.7	58.4	1,780	4.36	202		90		113		43		1,000
WWTP	**MW199**	**12 Dec 2022**	**0089_QC208_221212**	**Interlab Duplicate**	**950091**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW199**	**13 Mar 2023**	**0089_MW199_230313**	**Normal**	**EP2303084**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	440	<1	440	97.2	91.1	2,940	3.24	262		108		161		77		1,620
WWTP	**MW199**	**13 Mar 2023**	**0089_QC111_230313**	**Field Duplicate**	**EP2303084**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	438	<1	438	106	94.7	3,220	5.71	317		110		171		81		1,680
WWTP	**MW199**	**13 Mar 2023**	**0089_QC211_230313**	**Interlab Duplicate**	**972487**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW199**	**06 Jun 2023**	**0089_MW199_230606**	**Normal**	**EP2307415**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	364	<1	364	18.1	18.3	340	0.72	58		89		42		10		234
WWTP	**MW199**	**06 Jun 2023**	**0089_QC106_230606**	**Field Duplicate**	**EP2307415**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	371	<1	371	19.2	19.4	372	0.59	60		87		43		11		258
WWTP	**MW199**	**06 Jun 2023**	**0089_QC206_230606**	**Interlab Duplicate**	**997465**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
WWTP	**MW200**	**09 Aug 2017**	**0089_MW200_S_170809**	**Normal**	**199252**	<0.005	<0.01	<0.002	<0.05					550					2,200	7.5			110		130		51		1,700
WWTP	**MW200**	**18 Sep 2017**	**0089_MW200_S_170918**	**Normal**	**176030**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW200**	**19 Oct 2017**	**0089_MW200_S_171019**	**Normal**	**178275**	<0.005	<0.02	<0.002	<0.05																				
WWTP	**MW200**	**15 Nov 2017**	**0089_MW200_S_171115**	**Normal**	**203378**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW200**	**07 Dec 2017**	**0089_MW200_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW200**	**16 Jan 2018**	**0089_MW200_S_180116**	**Normal**	**205631**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW200**	**09 Jan 2020**	**0089_MW200_200109**	**Normal**	**EP2000249**	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	445	<1	445	49.4	47.6	1,320	1.86	158		73		140		46		719
WWTP	**MW200**	**31 Mar 2020**	**0089_MW200_200331**	**Normal**	**EP2003374**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	430	<1	430	46.7	49.1	1,230	2.49	166		74		144		48		744
WWTP	**MW200**	**15 Jul 2020**	**0089_MW200_200715**	**Normal**	**EP2007382**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	534	<1	534	92.6	90.2	2,700	1.26	275		120		146		87		1,610
WWTP	**MW200**	**24 Sep 2020**	**0089_MW200_200924**	**Normal**	**EP2010273**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	437	<1	437	76.4	69.8	2,220	4.53	241		91		109		73		1,250
WWTP	**MW200**	**15 Dec 2020**	**0089_MW200_201215**	**Normal**	**EP2014051**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	405	<1	405	74.4	72.9	2,180	1.01	232		100		117		69		1,300
WWTP	**MW200**	**15 Dec 2020**	**0089_QC115_201215**	**Field Duplicate**	**EP2014051**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	409	<1	409	73.2	71.3	2,140	1.31	225		99		114		69		1,270
WWTP	**MW200**	**15 Dec 2020**	**0089_QC215_201115**	**Interlab Duplicate**	**765054**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	480	<20	480			2,400			120		110		54		1,400	

						uoroalkyl Sulfonamides				PFAS			Inorganics								Metals								
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																			
PFAS NEMP 2020 Freshwater 99%																													
PFAS NEMP 2020 Recreational Water										**2**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
WWTP	**MW200**	**16 Mar 2021**	**0089_MW200_210316**	**Normal**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	421	<1	421	93.0	96.6	2,780	1.88	299		123		160		98		1,720
WWTP	**MW200**	**09 Jun 2021**	**0089_MW200_210609**	**Normal**	**EP2106514**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	451	<1	451	91.5	95.4	2,710	2.09	290		125		160		97		1,690
WWTP	**MW200**	**01 Sep 2021**	**0089_MW200_210901**	**Normal**	**EP2110159**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	462	<1	462	69.3	72.1	1,950	1.98	244		104		119		74		1,270
WWTP	**MW200**	**10 Jan 2022**	**0089_MW200_220110**	**Normal**	**EP2200216**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	411	<1	411	62.3	55.0	1,780	6.22	187		81		86		53		978
WWTP	**MW200**	**14 Mar 2022**	**0089_MW200_220314**	**Normal**	**EP2202976**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	389	<1	389	70.4	75.1	2,060	3.20	219		112		123		77		1,320
WWTP	**MW200**	**07 Jun 2022**	**0089_MW200_220607**	**Normal**	**EP2206883**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	484	<1	484	91.2	86.1	2,690	2.90	273		130		141		91		1,510
WWTP	**MW200**	**05 Sep 2022**	**0089_MW200_220905**	**Normal**	**EP2211340**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	466	<1	466	75.0	68.1	2,170	4.82	214		94		105		66		1,220
WWTP	**MW200**	**12 Dec 2022**	**0089_MW200_221212**	**Normal**	**EP2216876**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	436	<1	436	68.0	59.9	1,950	6.31	204		84		89		55		1,080
WWTP	**MW200**	**14 Mar 2023**	**0089_MW200_230314**	**Normal**	**EP2303177**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	421	<1	421	67.3	69.1	1,940	1.31	200		84		98		62		1,270
WWTP	**MW200**	**07 Jun 2023**	**0089_MW200_230607**	**Normal**	**EP2307555**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	524	<1	524	88.0	98.8	2,560	5.73	258		114		126		70		1,860
WWTP	**MW200**	**05 Sep 2023**	**0089_MW200_230905**	**Normal**	**EP2312170**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	464	<1	464	63.4	67.7	1,760	3.28	214		90		98		63		1,230
WWTP	**MW202**	**09 Aug 2017**	**0089_MW202_S_170809**	**Normal**	**199252**	<0.005	<0.01	<0.002	<0.05					400					280	3.4			100		35		12		240
WWTP	**MW202**	**18 Sep 2017**	**0089_MW202_S_170918**	**Normal**	**176030**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW202**	**19 Oct 2017**	**0089_MW202_S_171019**	**Normal**	**178275**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW202**	**15 Nov 2017**	**0089_MW202_S_171115**	**Normal**	**203378**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW202**	**07 Dec 2017**	**0089_MW202_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW202**	**16 Jan 2018**	**0089_MW202_S_180116**	**Normal**	**205631**	<0.005	<0.01	<0.002	<0.05																				
WWTP	**MW202**	**31 Mar 2020**	**0089_MW202_200331**	**Normal**	**EP2003374**	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	1	371	<1	373	11.3	11.2	112	0.42	35		98		24		8		96
WWTP	**MW202**	**31 Mar 2020**	**0089_QC103_200331**	**Field Duplicate**	**EP2003374**	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	5	363	<1	368	11.2	11.0	112	0.81	35		96		24		8		94
WWTP	**MW202**	**31 Mar 2020**	**0089_QC203_200331**	**Interlab Duplicate**	**711434**	<0.05	<0.05	<0.05	<0.05	0.06	0.06	<0.1	<20	360	<20	360			160			82		25		7.9		110	
WWTP	**MW202**	**22 Jul 2020**	**0089_MW202_200722**	**Normal**	**EP2007667**	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	364	<1	364	11.9	11.8	128	0.33	48		97		24		8		110
WWTP	**MW202**	**21 Sep 2020**	**0089_MW202_200921**	**Normal**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	*0.15*	0.15	0.15	<1	367	<1	367	12.1	11.1	133	4.22	50		95		23		8		99
WWTP	**MW202**	**21 Sep 2020**	**0089_QC112_200921**	**Field Duplicate**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	*0.11*	0.11	0.11	<1	364	<1	364	11.9	11.5	131	1.73	46		100		24		8		100
WWTP	**MW202**	**22 Sep 2020**	**0089_QC212_200921**	**Interlab Duplicate**	**746269**	<0.05	<0.05	<0.05	<0.05	*0.09*	0.09	<0.1	14	270	<20	280			120			75		32		6.1		110	
WWTP	**MW202**	**16 Dec 2020**	**0089_MW202_201216**	**Normal**	**EP2014087**	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	349	<1	349	12.6	13.3	167	2.50	46		107		23		9		134
WWTP	**MW202**	**15 Mar 2021**	**0089_MW202_210315**	**Normal**	**EP2102755**	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09	<1	319	<1	319	10.5	11.5	111	4.52	47		100		24		8		99
WWTP	**MW202**	**10 Jun 2021**	**0089_MW202_210610**	**Normal**	**EP2106588**	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	320	<1	320	11.3	11.6	137	1.12	52		104		26		7		94
WWTP	**MW202**	**30 Aug 2021**	**0089_MW202_210830**	**Normal**	**EP2110019**	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1	356	<1	356	15.2	13.9	245	4.66	59		100		22		12		156
WWTP	**MW202**	**12 Jan 2022**	**0089_MW202_220112**	**Normal**	**EP2200288**	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1	344	<1	344	13.8	12.4	198	5.20	64		93		28		12		119
WWTP	**MW202**	**18 Mar 2022**	**0089_MW202_220318**	**Normal**	**EP2203194**	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	349	<1	349	15.4	14.6	249	2.77	70		115		32		13		136
WWTP	**MW202**	**08 Jun 2022**	**0089_MW202_220608**	**Normal**	**EP2206971**	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1	382	<1	382	19.8	21.0	367	2.84	90		139		44		18		230
WWTP	**MW202**	**05 Sep 2022**	**0089_MW202_220905**	**Normal**	**EP2211345**	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	411	<1	411	26.0	23.5	548	5.03	112		121		51		31		287
WWTP	**MW202**	**12 Dec 2022**	**0089_MW202_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	392	<1	392	20.1	17.8	376	6.27	82		96		34		17		224
WWTP	**MW202**	**13 Mar 2023**	**0089_MW202_230313**	**Normal**	**EP2303085**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	200	<1	200	9.93	11.8	161	8.76	67		80		25		7		129
WWTP	**MW202**	**07 Jun 2023**	**0089_MW202_230607**	**Normal**	**EP2307497**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	356	<1	356	14.0	14.1	212	0.31	45		116		23		5		145
WWTP	**MW202**	**05 Sep 2023**	**0089_MW202_230905**	**Normal**	**EP2312177**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	380	<1	380	16.3	14.8	266	4.81	56		101		28		8		166
WWTP	**MW203**	**09 Aug 2017**	**0089_MW203_S_170809**	**Normal**	**199252**	<0.005	<0.01	<0.002	<0.05					390					170	5.5			94		59		12		180
WWTP	**MW203**	**08 Jan 2020**	**0089_MW203_200108**	**Normal**	**EP2000182**	<0.05	<0.05	<0.02	<0.05	<0.01	0.03	0.03	<1	301	<1	301	10.7	12.1	71	6.42	127		74		56		10		82
WWTP	**MW203**	**31 Mar 2020**	**0089_MW203_200331**	**Normal**	**EP2003374**	<0.05	<0.05	<0.02	<0.05	<0.01	0.03	0.05	<1	297	<1	297	9.93	11.6	65	7.67	104		75		56		9		69
WWTP	**MW203**	**31 Mar 2020**	**0089_QC102_200331**	**Field Duplicate**	**EP2003374**	<0.05	<0.05	<0.02	<0.05	<0.01	0.04	0.06	<1	300	<1	300	10.3	11.8	71	7.00	111		74		57		10		74
WWTP	**MW203**	**31 Mar 2020**	**0089_QC202_200331**	**Interlab Duplicate**	**711434**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																		
WWTP	**MW203**	**15 Jul 2020**	**0089_MW203_200715**	**Normal**	**EP2007385**	<0.05	<0.05	<0.02	<0.05	<0.01	0.04	0.08	<1	325	<1	325	10.0	11.2	54	5.16	98		76		51		8		68
WWTP	**MW203**	**22 Sep 2020**	**0089_MW203_200922**	**Normal**	**EP2010141**	<0.05	<0.05	<0.02	<0.05	0.04	0.08	0.10	<1	316	<1	316	9.10	10.1	48	5.29	69		77		44		7		57
WWTP	**MW203**	**16 Dec 2020**	**0089_MW203_201216**	**Normal**	**EP2014087**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	296	<1	296	8.52	9.91	46	7.54	63		75		43		6		57
WWTP	**MW203**	**16 Mar 2021**	**0089_MW203_210316**	**Normal**	**EP2102837**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	0.02	<1	345	<1	345	9.51	10.5	44	4.84	66		80		47		7		56
WWTP	**MW203**	**09 Jun 2021**	**0089_MW203_210609**	**Normal**	**EP2106514**	<0.05	<0.05	<0.02	<0.05	*0.11*	0.11	0.11	<1	274	<1	274	7.83	10.1	45	12.5	52		87		41		5		51
WWTP	**MW203**	**30 Aug 2021**	**0089_MW203_210830**	**Normal**	**EP2110019**	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.11	<1	292	<1	292	7.97	8.63	44	3.97	43		75		37		4		40
WWTP	**MW203**	**10 Jan 2022**	**0089_MW203_220110**	**Normal**	**EP2200216**	<0.05	<0.05	<0.02	<0.05	0.07	0.09	0.11	<1	302	<1	302	10.2	9.11	70	5.91	108		65		39		7		57
WWTP	**MW203**	**17 Mar 2022**	**0089_MW203_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	291	<1	291	9.20	10.5	67	6.39	72		83		45		7		56
WWTP	**MW203**	**07 Jun 2022**	**0089_MW203_220607**	**Normal**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	312	<1	312	9.02	9.74	47	3.84	70		79		40		6		54
WWTP	**MW203**	**07 Jun 2022**	**0089_QC115_220607**	**Field Duplicate**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04																		
WWTP	**MW203**	**07 Jun 2022**	**0089_QC215_220607**	**Interlab Duplicate**	**896805**	<0.008	<0.004	<0.004	<0.008	0.026	0.071	0.078																		
WWTP	**MW203**	**06 Sep 2022**	**0089_MW203_220906**	**Normal**	**EP2211390**	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	292	<1	292	8.55	9.32	44	4.31	71		75		39		6		51
WWTP	**MW203**	**12 Dec 2022**	**0089_MW203_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.02	<0.05	*0.12*	0.12	0.12	<1	310	<1	310	8.71	8.95	42	1.35	64		81		38		5		38
WWTP	**MW203**	**13 Mar 2023**	**0089_MW203_230313**	**Normal**	**EP2303085**	<0.05	<0.05	<0.02	<0.05	0.04	0.06	0.06	8	318	<1	326	12.6	12.0	90	2.47	172		48		58		13		104
WWTP	**MW203**	**06 Jun 2023**	**0089_MW203_230606**	**Normal**	**EP2307415**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	282	<1	282	8.91	9.20	60	1.58	76		70		41		6		50
WWTP	**MW203**	**05 Sep 2023**	**0089_MW203_230905**	**Normal**	**EP2312183**	<0.05	<0.05	<0.02	<0.05	0.03	0.05	0.05	<1	331	<1	331	15.5	13.6	174	6.43	191		61		59		13		124
HSF	**MW214**	**02 Aug 2017**	**0089_MW214_S_170802**	**Normal**	**198991**	<0.005	<0.01	<0.002	<0.05					290					400	0.95			140		29		4.9		210
HSF	**MW214**	**01 Sep 2021**	**0089_MW214_210901**	**Normal**	**EP2110159**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	558	<1	558	31.8	27.1	721	7.95	14		206		52		9		283
HSF	**MW214**	**13 Jan 2022**	**0089_MW214_220113**	**Normal**	**EP2200340**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	375	<1	375	35.8	34.6	981	1.80	32		197		67		10		436
HSF	**MW214**	**16 Mar 2022**	**0089_MW214_220316**	**Normal**	**EP2203057**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	352	<1	352	87.1	82.1	2,750	2.96	120		288		175		10		1,220
HSF	**MW214**	**07 Jun 2022**	**0089_MW214_220607**	**Normal**	**EP2206888**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	526	<1	526	38.4	37.8	971	0.77	22		231		78		15		447
HSF	**MW214**	**06 Sep 2022**	**0089_MW214_220906**	**Normal**	**EP2211400**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	471	<1	471	27.7	25.3	643	4.61	9		202		46		8		258
HSF	**MW214**	**13 Dec 2022**	**0089_MW214_221213**	**Normal**	**EP2216929**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	424	<1	424	27.4	26.7	602	1.34	96		218		44		7		277
HSF	**MW214**	**14 Mar 2023**	**0089_MW214_230314**	**Normal**	**EP2303177**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	430	<1	430	78.8	74.9	2,450	2.52	52		262		152		7		1,130
HSF	**MW214**	**08 Jun 2023**	**0089_MW214_230608**	**Normal**	**EP2307588**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	453	<1	453	44.7	44.9	1,250	0.18	19		223		82		6		617
HSF	**MW214**	**04 Sep 2023**	**0089_MW214_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	382	<1	382	25.5	22.7	607	5.92	37		157		41		6		260
HSF	**MW215**	**02 Aug 2017**	**0089_MW215_S_170802**	**Normal**	**198991**	<0.005	<0.01	<0.002	<0.05					200					160	5.3			100		18		4.4		80
HSF	**MW215**	**01 Sep 2021**	**0089_MW215_210901**	**Normal**	**EP2110159**	<0.05	<0.05	<0.02	<0.05	*0.35*	0.38	0.41	<1	324	<1	324	14.2	12.5	229	6.28	59		116		27		5		100
HSF	**MW215**	**13 Jan 2022**	**0089_MW215_220113**	**Normal**	**EP2200340**	<0.05	<0.05	<0.02	<0.05	*0.47*	0.68	0.74	<1	290	<1	290	16.8	15.4	325	4.05	86		123		34		8		145
HSF	**MW215**	**16 Mar 2022**	**0089_MW215_220316**	**Normal**	**EP2203057**	<0.05	<0.05	<0.02	<0.05	*0.61*	1.33	1.45	<1	310	<1	310	28.1	27.2	685	1.56	125		192		56		16		291
HSF	**MW215**	**07 Jun 2022**	**0089_MW215_220607**	**Normal**	**EP2206888**	<0.05	<0.05	<0.02	<0.05	*0.80*	1.53	1.70	<1	316	<1	316	28.3	24.8	676	6.52	139		173		48		14		273
HSF	**MW215**	**06 Sep 2022**	**0089_MW215_220906**	**Normal**	**EP2211400**	<0.05	<0.05	<0.02	<0.05	*0.73*	1.16	1.29	<1	311	<1	311	21.1	19.2	466	4.64	84		142		38		11		201
HSF	**MW215**	**13 Dec 2022**	**0089_MW215_221213**	**Normal**	**EP2216929**	<0.05	<0.05	<0.02	<0.05	*0.24*	0.34	0.34	<1	304	<1	304	18.0	16.7	398	3.73	32		119		27		3		194
HSF	**MW215**	**14 Mar 2023**	**0089_MW215_230314**	**Normal**	**EP2303177**	<0.05	<0.05	<0.02	<0.05	*0.45*	0.67	0.73	<1	291	<1	291	19.2	17.1	408	5.70	88		129		35		8		174
HSF	**MW215**	**08 Jun 2023**	**0089_MW215_230608**	**Normal**	**EP2307588**	<0.05	<0.05	<0.02	<0.05	*0.63*	0.97	1.09	<1	279	<1	279	25.9	25.4	611	1.10	149		161		42		13		311
HSF	**MW215**	**04 Sep 2023**	**0089_MW215_230904**	**Normal**	**EP2312228**	<0.05	<0.05	<0.02	<0.05	*0.49*	0.57	0.62	<1	256	<1	256	12.5	11.2	220	5.58	59		98		22		5		101
HSF	**MW216**	**02 Aug 2017**	**0089_MW216_S_170802**	**Normal**	**198991**	<0.005	<0.01	<0.002	<0.05					280					130	3.4			87		26		3.1		99
HSF	**MW216**	**11 Sep 2017**	**0089_MW216_S_170911**	**Normal**	**175533**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW216**	**16 Oct 2017**	**0089_MW216_S_171016**	**Normal**	**177956**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW216**	**17 Nov 2017**	**0089_MW216_S_171117**	**Normal**	**203443**	0.006	<0.1	<0.002	<0.05																				
HSF	**MW216**	**05 Dec 2017**	**0089_MW216_S_171205**	**Normal**	**204183**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW216**	**15 Jan 2018**	**0089_MW216_S_180115**	**Normal**	**205568**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW216**	**19 Dec 2019**	**0089_MW216_191219**	**Normal**	**EP1913598**	<0.05	<0.05	<0.02	<0.05	***3.89***	7.80	8.38	<1	258	<1	258	12.0	11.9	198	0.16	59		103		26		5		104
HSF	**MW216**	**31 Mar 2020**	**0089_MW216_200331**	**Normal**	**EP2003366**	<0.05	<0.05	<0.02	<0.05	***2.65***	10.3	10.7	<1	240	<1	240	16.4	16.8	371	1.26	56		140		41		7		145
HSF	**MW216**	**22 Jul 2020**	**0089_MW216_200722**	**Normal**	**EP2007667**	<0.05	<0.05	<0.02	<0.05	***3.61***	10.1	10.7	<1	287	<1	287	15.8	15.4	312	1.26	62		130		36		6		134
HSF	**MW216**	**15 Dec 2020**	**0089_MW216_201215**	**Normal**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	***4.85***	15.6	16.4	<1	354	<1	354	17.3	16.8	309	1.21	71		148		41		7		136
HSF	**MW216**	**15 Dec 2020**	**0089_QC113_201215**	**Field Duplicate**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	***4.55***	14.4	15.1	<1	385	<1	385	17.9	17.1	310	2.18	71		150		42		8		138
HSF	**MW216**	**15 Dec 2020**	**0089_QC213_201115**	**Interlab Duplicate**	**765054**	<0.05	<0.05	<0.05	<0.05	***4.19***	14.23	14.91	<10	3,400	<20	3,400			310			120		56		7.6		180	
HSF	**MW216**	**18 Mar 2021**	**0089_MW216_210318**	**Normal**	**EP2102955**	<0.05	<0.05	<0.02	<0.05	***4.30***	13.3	13.8	<1	318	<1	318	16.7	16.5	309	0.72	80		135		40		8		144
HSF	**MW216**	**09 Jun 2021**	**0089_MW216_210609**	**Normal**	**EP2106514**	<0.05	<0.05	<0.02	<0.05	***4.57***	16.0	16.7	<1	310	<1	310	17.8	17.4	361	1.36	70		144		40		7		154
HSF	**MW216**	**31 Aug 2021**	**0089_MW216_210831**	**Normal**	**EP2110071**	<0.05	<0.05	<0.02	<0.05	***4.49***	14.8	15.5	<1	313	<1	313	19.2	16.6	407	7.23	68		128		38		7		158

Table 1 - Groundwater Analytical Results

						uoroalkyl Sulfonamides				PFAS			Inorganics								Metals							
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																		
PFAS NEMP 2020 Freshwater 99%																												
PFAS NEMP 2020 Recreational Water										**2**																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																							
HSF	**MW216**	**13 Jan 2022**	**0089_MW216_220113**	**Normal**	**EP2200340**	<0.05	<0.05	<0.02	<0.05	***6.18***	18.1	18.8	<1	324	<1	324	20.8	19.5	446	3.01	82		148		49		5		184
HSF	**MW216**	**16 Mar 2022**	**0089_MW216_220316**	**Normal**	**EP2203057**	<0.05	<0.05	<0.02	<0.05	***4.51***	16.5	17.4	<1	356	<1	356	20.8	18.6	423	5.61	87		144		44		7		176
HSF	**MW216**	**07 Jun 2022**	**0089_MW216_220607**	**Normal**	**EP2206888**	<0.05	<0.05	<0.02	<0.05	***4.45***	15.1	15.7	<1	343	<1	343	20.3	18.2	407	5.41	96		148		41		7		168
HSF	**MW216**	**05 Sep 2022**	**0089_MW216_220905**	**Normal**	**EP2211340**	<0.05	<0.05	<0.02	<0.05	***4.19***	24.5	25.1	<1	287	<1	287	23.0	22.1	533	2.12	110		162		50		8		223
HSF	**MW216**	**13 Dec 2022**	**0089_MW216_221213**	**Normal**	**EP2216929**	<0.05	<0.05	<0.02	<0.05	***4.98***	58.8	59.5	<1	264	<1	264	34.6	35.6	898	1.38	192		218		66		10		437
HSF	**MW216**	**14 Mar 2023**	**0089_MW216_230314**	**Normal**	**EP2303177**	<0.05	<0.05	<0.02	<0.05	***2.62***	31.9	32.2	<1	285	<1	285	37.1	37.7	957	0.79	212		206		70		10		492
HSF	**MW216**	**08 Jun 2023**	**0089_MW216_230608**	**Normal**	**EP2307588**	<0.05	<0.05	<0.02	<0.05	***3.12***	27.4	27.8	<1	288	<1	288	34.0	34.6	825	0.92	240		196		59		9		455
HSF	**MW216**	**04 Sep 2023**	**0089_MW216_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	*1.86*	22.4	22.6	<1	314	<1	314	28.1	25.6	642	4.58	178		136		49		11		334
HSF	**MW217**	**02 Aug 2017**	**0089_MW217_S_170802**	**Normal**	**198991**	<0.005	<0.01	<0.002	<0.05					300					54	5.7			120		15		2.5		40
HSF	**MW217**	**11 Sep 2017**	**0089_MW217_S_170911**	**Normal**	**175533**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW217**	**11 Sep 2017**	**0089_QC1MW_170911**	**Field Duplicate**	**175533**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW217**	**11 Sep 2017**	**0089_QC2MW_170911**	**Interlab Duplicate**	**562844**	<0.05	<0.05	<0.05	<0.05	*0.44*	25.63	25.77																	
HSF	**MW217**	**16 Oct 2017**	**0089_MW217_S_171016**	**Normal**	**177956**	<0.05	<0.2	<0.02	<1																				
HSF	**MW217**	**17 Nov 2017**	**0089_MW217_S_171117**	**Normal**	**203443**	<0.005	<0.1	<0.002	<0.05																				
HSF	**MW217**	**05 Dec 2017**	**0089_MW217_S_171205**	**Normal**	**204183**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW217**	**15 Jan 2018**	**0089_MW217_S_180115**	**Normal**	**205568**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW217**	**19 Dec 2019**	**0089_MW217_191219**	**Normal**	**EP1913595**	<0.05	<0.05	<0.02	<0.05	*0.15*	38.8	38.8	<1	236	<1	236	6.21	6.05	45	1.33	11		80		8		2		31
HSF	**MW217**	**31 Mar 2020**	**0089_MW217_200331**	**Normal**	**EP2003366**	<0.05	<0.05	<0.02	<0.05	0.06	23.2	23.2	<1	162	<1	162	4.36	4.83	36	5.16	5		64		5		2		27
HSF	**MW217**	**22 Jul 2020**	**0089_MW217_200722**	**Normal**	**EP2007667**	<0.05	<0.05	<0.02	<0.05	0.05	43.4	43.5	<1	250	<1	250	6.70	6.82	47	0.96	18		92		9		4		32
HSF	**MW217**	**22 Jul 2020**	**0089_QC114_200722**	**Field Duplicate**	**EP2007667**	<0.05	<0.05	<0.02	<0.05	0.07	47.0	47.0	<1	254	<1	254	6.83	6.36	49	3.60	18		84		9		3		31
HSF	**MW217**	**22 Jul 2020**	**0089_QC214_200722**	**Interlab Duplicate**	**734409**	<0.05	<0.05	<0.05	<0.05	0.03	9.6	9.64	<10	290	<20	290			50			79		13		<5		31	
HSF	**MW217**	**24 Sep 2020**	**0089_MW217_200924**	**Normal**	**EP2010271**	<0.05	<0.05	<0.02	<0.05	*0.27*	34.0	34.1	<1	234	<1	234	6.35	6.41	52	0.48	10		85		8		3		33
HSF	**MW217**	**15 Dec 2020**	**0089_MW217_201215**	**Normal**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	0.03	27.9	27.9	<1	204	<1	204	5.29	5.32	37	0.36	8		74		6		2		25
HSF	**MW217**	**18 Mar 2021**	**0089_MW217_210318**	**Normal**	**EP2102955**	<0.05	<0.05	<0.02	<0.05	0.02	36.4	36.4	<1	292	<1	292	7.31	6.85	39	3.24	18		93		9		3		32
HSF	**MW217**	**09 Jun 2021**	**0089_MW217_210609**	**Normal**	**EP2106514**	<0.05	<0.05	<0.02	<0.05	0.02	47.1	47.1	<1	240	<1	240	6.57	7.70	52	7.89	15		105		11		3		34
HSF	**MW217**	**31 Aug 2021**	**0089_MW217_210831**	**Normal**	**EP2110064**	<0.05	<0.05	<0.02	<0.05	*0.08*	56.2	56.2	<1	276	<1	276	7.70	8.03	51	2.09	36		104		11		6		41
HSF	**MW217**	**13 Jan 2022**	**0089_MW217_220113**	**Normal**	**EP2200339**	<0.05	<0.05	<0.02	<0.05	0.05	51.9	52.0	<1	261	<1	261	7.67	9.08	54	8.39	45		113		13		6		51
HSF	**MW217**	**17 Mar 2022**	**0089_MW217_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	*0.11*	52.5	52.5	<1	267	<1	267	8.26	9.95	60	9.31	59		125		14		10		53
HSF	**MW217**	**08 Jun 2022**	**0089_MW217_220608**	**Normal**	**EP2206971**	<0.05	<0.05	<0.02	<0.05	*0.08*	33.9	33.9	<1	268	<1	268	7.83	9.67	51	10.5	50		129		15		10		40
HSF	**MW217**	**08 Sep 2022**	**0089_MW217_220908**	**Normal**	**EP2211535**	<0.05	<0.05	<0.02	<0.05	*0.10*	24.5	24.5	<1	296	<1	296	8.57	9.67	50	6.01	60		118		14		11		54
HSF	**MW217**	**13 Dec 2022**	**0089_MW217_221213**	**Normal**	**EP2216933**	<0.05	<0.05	<0.02	<0.05	*0.12*	15.4	15.4	<1	288	<1	288	8.56	8.65	75	0.53	33		111		15		7		39
HSF	**MW217**	**15 Mar 2023**	**0089_MW217_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	0.05	42.5	42.5	<1	277	<1	277	8.40	8.97	50	3.27	70		114		15		12		40
HSF	**MW217**	**08 Jun 2023**	**0089_MW217_230608**	**Normal**	**EP2307586**	<0.05	<0.05	<0.02	<0.05	0.04	36.1	36.1	<1	306	<1	306	7.72	7.26	31	3.04	35		102		11		7		25
HSF	**MW217**	**04 Sep 2023**	**0089_MW217_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	0.04	31.3	31.3	<1	293	<1	293	7.42	7.02	34	2.71	29		93		12		7		28
HSF	**MW220**	**26 Feb 2016**	**HDF_MB50**	**Normal**	**EP1601702**																								
HSF	**MW220**	**04 Nov 2016**	**HSF_MB50**	**Normal**	**522565**																								
HSF	**MW220**	**02 Aug 2017**	**0089_MW220_S_170802**	**Normal**	**198991**	<0.005	<0.01	<0.002	<0.05					420					290	7.5			200		30		23		170
HSF	**MW220**	**11 Sep 2017**	**0089_MW220_S_170911**	**Normal**	**175533**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW220**	**16 Oct 2017**	**0089_MW220_S_171016**	**Normal**	**177956**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW220**	**17 Nov 2017**	**0089_MW220_S_171117**	**Normal**	**203443**	<0.005	<0.1	<0.002	<0.05																				
HSF	**MW220**	**05 Dec 2017**	**0089_MW220_S_171205**	**Normal**	**204183**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW220**	**05 Dec 2017**	**0089_QC1MW_171205**	**Field Duplicate**	**204183**	<0.005	<0.02	<0.002	<0.05																				
HSF	**MW220**	**05 Dec 2017**	**0089_QC2MW_171205**	**Interlab Duplicate**	**576083**	<0.05	<0.05	<0.05	<0.05	***2.56***	4.67	4.93																	
HSF	**MW220**	**15 Jan 2018**	**0089_MW220_S_180115**	**Normal**	**205568**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW220**	**09 Jun 2021**	**0089_MW220_210609**	**Normal**	**EP2106514**	<0.05	<0.05	<0.02	<0.05	***13.0***	15.3	15.9																	
HSF	**MW220**	**13 Jan 2022**	**0089_MW220_220113**	**Normal**	**EP2200339**	<0.05	<0.05	<0.02	<0.05	***77.4***	82.2	83.2	<1	359	<1	359	9.85	10.0	69	0.89	35		109		22		15		55
HSF	**MW220**	**08 Jun 2022**	**0089_MW220_220608**	**Normal**	**EP2206971**	<0.05	<0.05	<0.02	<0.05	***27.5***	30.2	30.9	<1	340	<1	340	9.10	11.0	50	9.33	43		128		21		13		58
HSF	**MW220**	**08 Sep 2022**	**0089_MW220_220908**	**Normal**	**EP2211535**	<0.05	<0.05	<0.02	<0.05	***34.4***	37.3	38.0	<1	352	<1	352	9.23	9.39	50	0.84	38		114		18		12		44
HSF	**MW220**	**13 Dec 2022**	**0089_MW220_221213**	**Normal**	**EP2216933**	<0.05	<0.05	<0.02	<0.05	***23.6***	24.9	25.2	<1	259	<1	259	6.89	7.22	41	2.32	27		92		13		10		30
HSF	**MW220**	**15 Mar 2023**	**0089_MW220_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	***12.7***	13.6	13.8	<1	280	<1	280	7.61	7.08	50	3.57	29		80		15		8		38
HSF	**MW220**	**08 Jun 2023**	**0089_MW220_230608**	**Normal**	**EP2307586**	<0.05	<0.05	<0.02	<0.05	***8.09***	8.89	9.04	<1	263	<1	263	7.94	8.02	79	0.50	22		102		16		7		33
HSF	**MW220**	**04 Sep 2023**	**0089_MW220_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	***5.18***	5.50	5.58	<1	263	<1	263	7.48	6.55	64	6.60	20		80		12		7		32
HSF	**MW224**	**09 Aug 2017**	**0089_MW224_S_170809**	**Normal**	**199252**	<0.005	<0.01	<0.002	<0.05					280					120	-0.52			79		26		3.3		83
HSF	**MW224**	**19 Dec 2019**	**0089_MW224_191219**	**Normal**	**EP1913595**	<0.05	<0.05	<0.02	<0.05	0.06	1.06	1.06	<1	206	<1	206	7.39	8.31	94	5.85	30		67		20		4		74
HSF	**MW224**	**31 Mar 2020**	**0089_MW224_200331**	**Normal**	**EP2003366**	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1	222	<1	222	8.29	8.86	113	3.30	32		72		22		4		77
HSF	**MW224**	**22 Jul 2020**	**0089_MW224_200722**	**Normal**	**EP2007667**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	241	<1	241	9.08	9.27	124	1.03	37		70		23		4		87
HSF	**MW224**	**24 Sep 2020**	**0089_MW224_200924**	**Normal**	**EP2010273**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	231	<1	231	8.85	9.23	122	2.13	38		70		22		4		88
HSF	**MW224**	**15 Dec 2020**	**0089_MW224_201215**	**Normal**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	237	<1	237	8.52	8.55	109	0.20	34		64		20		4		83
HSF	**MW224**	**18 Mar 2021**	**0089_MW224_210318**	**Normal**	**EP2102955**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	214	<1	214	8.28	8.59	114	1.82	38		63		20		4		85
HSF	**MW224**	**09 Jun 2021**	**0089_MW224_210609**	**Normal**	**EP2106514**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	216	<1	216	8.29	8.85	112	3.30	39		64		21		4		88
HSF	**MW224**	**31 Aug 2021**	**0089_MW224_210831**	**Normal**	**EP2110064**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	225	<1	225	8.83	8.24	125	3.50	39		56		21		4		83
HSF	**MW224**	**12 Jan 2022**	**0089_QC218_220113**	**Interlab Duplicate**	**855202**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
HSF	**MW224**	**13 Jan 2022**	**0089_MW224_220113**	**Normal**	**EP2200339**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	219	<1	219	8.55	8.55	120	<0.01	38		58		21		4		88
HSF	**MW224**	**13 Jan 2022**	**0089_QC118_220113**	**Field Duplicate**	**EP2200339**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
HSF	**MW224**	**17 Mar 2022**	**0089_MW224_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1	233	<1	233	8.86	9.08	121	1.24	38		66		21		4		91
HSF	**MW224**	**08 Jun 2022**	**0089_MW224_220608**	**Normal**	**EP2206971**	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	0.10	<1	242	<1	242	8.88	9.66	113	4.23	41		67		25		5		95
HSF	**MW224**	**08 Sep 2022**	**0089_MW224_220908**	**Normal**	**EP2211535**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	234	<1	234	8.61	8.46	110	0.85	40		58		21		4		86
HSF	**MW224**	**13 Dec 2022**	**0089_MW224_221213**	**Normal**	**EP2216933**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	4	220	<1	224	8.31	8.92	110	3.53	35		61		22		4		91
HSF	**MW224**	**15 Mar 2023**	**0089_MW224_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	261	<1	261	9.48	8.01	110	8.39	56		48		20		4		89
HSF	**MW224**	**08 Jun 2023**	**0089_MW224_230608**	**Normal**	**EP2307586**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	316	<1	316	10.1	8.89	106	6.23	37		62		19		4		95
HSF	**MW224**	**04 Sep 2023**	**0089_MW224_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	288	<1	288	9.39	8.65	101	4.14	38		64		22		3		82
HSF	**MW225**	**02 Aug 2017**	**0089_MW225_S_170802**	**Normal**	**198991**	<0.005	<0.01	<0.002	<0.05					270					380	1.4			120		39		4.8		190
HSF	**MW225**	**11 Sep 2017**	**0089_MW225_S_170911**	**Normal**	**175533**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW225**	**19 Oct 2017**	**0089_MW225_S_171019**	**Normal**	**178275**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW225**	**17 Nov 2017**	**0089_MW225_S_171117**	**Normal**	**203443**	<0.005	<0.1	<0.002	<0.05																				
HSF	**MW225**	**05 Dec 2017**	**0089_MW225_S_171205**	**Normal**	**204183**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW225**	**15 Jan 2018**	**0089_MW225_S_180115**	**Normal**	**205568**	<0.005	<0.01	<0.002	<0.05																				
HSF	**MW225**	**01 Sep 2021**	**0089_MW225_210901**	**Normal**	**EP2110160**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	302	<1	302	22.0	18.6	522	8.23	58		134		39		8		196
HSF	**MW225**	**13 Jan 2022**	**0089_MW225_220113**	**Normal**	**EP2200340**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	399	<1	399	26.6	24.0	620	4.98	53		146		54		7		279
HSF	**MW225**	**16 Mar 2022**	**0089_MW225_220316**	**Normal**	**EP2203057**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	342	<1	342	24.5	23.4	588	2.28	54		149		53		10		262
HSF	**MW225**	**07 Jun 2022**	**0089_MW225_220607**	**Normal**	**EP2206888**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	319	<1	319	21.7	20.2	503	3.71	55		140		42		9		218
HSF	**MW225**	**07 Jun 2022**	**0089_QC112_220607**	**Field Duplicate**	**EP2206888**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
HSF	**MW225**	**07 Jun 2022**	**0089_QC212_220607**	**Interlab Duplicate**	**896805**	<0.008	<0.004	<0.004	<0.008	<0.002	<0.001	<0.001																	
HSF	**MW225**	**06 Sep 2022**	**0089_MW225_220906**	**Normal**	**EP2211400**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	314	<1	314	19.2	17.1	425	5.78	46		124		39		6		174
HSF	**MW225**	**13 Dec 2022**	**0089_MW225_221213**	**Normal**	**EP2216929**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	343	<1	343	19.2	18.3	405	2.57	46		125		40		5		198
HSF	**MW225**	**14 Mar 2023**	**0089_MW225_230314**	**Normal**	**EP2303177**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	352	<1	352	22.2	18.6	493	8.88	62		111		42		5		218
HSF	**MW225**	**08 Jun 2023**	**0089_MW225_230608**	**Normal**	**EP2307588**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	324	<1	324	21.0	20.4	482	1.34	43		141		41		5		227
HSF	**MW225**	**05 Sep 2023**	**0089_MW225_230904**	**Normal**	**EP2312187**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
HSF	**MW226**	**02 Aug 2017**	**0089_MW226_S_170802**	**Normal**	**198991**	<0.005	<0.01	<0.002	<0.05					630					15,000	0.78			400		1,000		340		9,000
HSF	**MW226**	**02 Aug 2017**	**0089_QC1MW_170802**	**Field Duplicate**	**198991**	<0.005	<0.01	<0.002	<0.05					630					16,000	-0.27			400		1,100		340		9,100
HSF	**MW226**	**03 Aug 2017**	**0089_QC2MW_170802**	**Interlab Duplicate**	**557195**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	590					16,000			420		1,200		390		9,600	
HSF	**MW226**	**11 Sep 2017**	**0089_MW226_S_170911**	**Normal**	**175533**	<0.005	<0.01	<0.002	<0.05																				

Table 1 - Groundwater Analytical Results

						uoroalkyl Sulfonamides				PFAS			Inorganics								Metals							
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																		
PFAS NEMP 2020 Freshwater 99%																												
PFAS NEMP 2020 Recreational Water										**2**																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																							
HSF	**MW226**	**19 Oct 2017**	**0089_MW226_S_171019**	**Normal**	**178275**	<0.005	<0.01	<0.002	<0.05																			
HSF	**MW226**	**17 Nov 2017**	**0089_MW226_S_171117**	**Normal**	**203443**	<0.005	<0.1	<0.002	<0.05																			
HSF	**MW226**	**05 Dec 2017**	**0089_MW226_S_171205**	**Normal**	**204183**	<0.005	<0.01	<0.002	<0.05																			
HSF	**MW226**	**15 Jan 2018**	**0089_MW226_S_180115**	**Normal**	**205568**	<0.005	<0.01	<0.002	<0.05																			
HSF	**MW226**	**14 Jan 2020**	**0089_MW226_200114**	**Normal**	**EP2000432**	<0.05	<0.05	<0.02	<0.05	<0.01	0.48	0.48	<1	540	<1	540	434	481	13,400	5.05	2,190		455		1,150		479		8,070
HSF	**MW226**	**02 Apr 2020**	**0089_MW226_200402**	**Normal**	**EP2003472**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	612	<1	612	476	560	14,600	8.07	2,500		482		1,290		601		9,520
HSF	**MW226**	**02 Apr 2020**	**0089_QC101_200402**	**Field Duplicate**	**EP2003472**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	557	<1	557	482	533	14,800	5.11	2,540		458		1,230		576		9,070
HSF	**MW226**	**02 Apr 2020**	**0089_QC201_200402**	**Interlab Duplicate**	**712006**	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1	<10	360	<20	360			16,000			440		1,200		400		9,500	
HSF	**MW226**	**21 Jul 2020**	**0089_MW226_200721**	**Normal**	**EP2007611**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	621	<1	621	465	524	14,400	5.96	2,230		446		1,200		534		8,950
HSF	**MW226**	**22 Sep 2020**	**0089_MW226_200922**	**Normal**	**EP2010143**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	637	<1	637	484	415	15,100	7.64	2,180		347		944		433		7,110
HSF	**MW226**	**15 Dec 2020**	**0089_MW226_201215**	**Normal**	**EP2014042**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	553	<1	553	475	512	14,700	3.82	2,350		452		1,210		529		8,660
HSF	**MW226**	**17 Mar 2021**	**0089_MW226_210317**	**Normal**	**EP2102900**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	542	<1	542	459	509	14,200	5.14	2,300		444		1,170		546		8,660
HSF	**MW226**	**10 Jun 2021**	**0089_MW226_210610**	**Normal**	**EP2106588**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	561	<1	561	476	535	14,800	5.88	2,250		452		1,250		538		9,100
HSF	**MW226**	**31 Aug 2021**	**0089_MW226_210831**	**Normal**	**EP2110071**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	666	<1	666	457	462	14,200	0.46	2,090		388		1,080		450		7,860
HSF	**MW226**	**13 Jan 2022**	**0089_MW226_220113**	**Normal**	**EP2200340**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	664	<1	664	474	505	14,900	3.21	1,940		411		1,170		465		8,660
HSF	**MW226**	**16 Mar 2022**	**0089_MW226_220316**	**Normal**	**EP2203057**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	612	<1	612	509	500	16,000	0.88	2,180		416		1,160		550		8,500
HSF	**MW226**	**07 Jun 2022**	**0089_MW226_220607**	**Normal**	**EP2206888**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	644	<1	644	446	529	13,700	8.49	2,260		477		1,290		508		8,880
HSF	**MW226**	**06 Sep 2022**	**0089_MW226_220906**	**Normal**	**EP2211390**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	593	<1	593	442	461	13,700	2.14	2,090		393		1,060		484		7,860
HSF	**MW226**	**13 Dec 2022**	**0089_MW226_221213**	**Normal**	**EP2216933**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	592	<1	592	493	486	15,500	0.68	2,110		406		1,070		461		8,420
HSF	**MW226**	**14 Mar 2023**	**0089_MW226_230314**	**Normal**	**EP2303178**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	595	<1	595	446	410	13,800	4.26	2,180		376		908		387		7,050
HSF	**MW226**	**08 Jun 2023**	**0089_MW226_230608**	**Normal**	**EP2307587**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	601	<1	601	441	485	13,800	4.74	1,920		480		1,050		350		8,410
HSF	**MW226**	**04 Sep 2023**	**0089_MW226_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	623	<1	623	458	471	14,200	1.39	2,150		409		1,110		495		7,960
HSF	**MW227**	**02 Aug 2017**	**0089_MW227_S_170802**	**Normal**	**198991**	<0.005	<0.01	<0.002	<0.05					350					1,400	0.97			140		87		28		820
HSF	**MW227**	**11 Sep 2017**	**0089_MW227_S_170911**	**Normal**	**175533**	<0.005	<0.01	<0.002	<0.05																			
HSF	**MW227**	**19 Oct 2017**	**0089_MW227_S_171019**	**Normal**	**178275**	<0.005	<0.01	<0.002	<0.05																			
HSF	**MW227**	**17 Nov 2017**	**0089_MW227_S_171117**	**Normal**	**203443**	<0.005	<0.1	<0.002	<0.05																			
HSF	**MW227**	**05 Dec 2017**	**0089_MW227_S_171205**	**Normal**	**204183**	<0.005	<0.01	<0.002	<0.05																			
HSF	**MW227**	**15 Jan 2018**	**0089_MW227_S_180115**	**Normal**	**205568**	<0.005	<0.01	<0.002	<0.05																			
HSF	**MW227**	**01 Apr 2020**	**0089_MW227_200401**	**Normal**	**EP2003417**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	464	<1	464	37.7	35.0	886	3.75	164		134		74		27		494
HSF	**MW227**	**01 Apr 2020**	**0089_QC104_200401**	**Field Duplicate**	**EP2003417**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	369	<1	369	33.1	31.5	797	2.50	156		126		66		23		441
HSF	**MW227**	**01 Apr 2020**	**0089_QC204_200401**	**Interlab Duplicate**	**711709**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	730	<20	730			880			110		77		21		500	
HSF	**MW227**	**22 Jul 2020**	**0089_MW227_200722**	**Normal**	**EP2007648**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	332	<1	332	31.1	30.0	768	1.76	135		121		60		24		424
HSF	**MW227**	**21 Sep 2020**	**0089_MW227_200921**	**Normal**	**EP2010085**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	361	<1	361	31.4	31.3	711	0.25	200		130		69		21		427
HSF	**MW227**	**15 Dec 2020**	**0089_MW227_201215**	**Normal**	**EP2014051**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	375	<1	375	37.4	38.3	910	1.21	204		121		68		25		599
HSF	**MW227**	**15 Mar 2021**	**0089_MW227_210315**	**Normal**	**EP2102752**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	528	<1	528	53.3	52.8	1,240	0.46	373		188		126		22		747
HSF	**MW227**	**10 Jun 2021**	**0089_MW227_210610**	**Normal**	**EP2106588**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	315	<1	315	50.1	54.5	1,410	4.22	193		132		99		53		883
HSF	**MW227**	**31 Aug 2021**	**0089_MW227_210831**	**Normal**	**EP2110071**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	360	<1	360	38.2	34.5	940	5.10	217		142		83		40		450
HSF	**MW227**	**14 Jan 2022**	**0089_MW227_220114**	**Normal**	**EP2200399**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	357	<1	357	35.2	32.7	834	3.63	217		116		71		25		470
HSF	**MW227**	**16 Mar 2022**	**0089_MW227_220316**	**Normal**	**EP2203057**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	550	<1	550	62.9	62.2	1,540	0.52	407		227		143		46		873
HSF	**MW227**	**07 Jun 2022**	**0089_MW227_220607**	**Normal**	**EP2206888**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	503	<1	503	51.9	45.7	1,260	6.31	302		157		106		45		644
HSF	**MW227**	**07 Sep 2022**	**0089_MW227_220907**	**Normal**	**EP2211611**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	374	<1	374	40.1	39.1	968	1.25	255		134		78		40		574
HSF	**MW227**	**13 Dec 2022**	**0089_MW227_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	381	<1	381	30.0	28.1	632	3.37	220		99		57		25		409
HSF	**MW227**	**14 Mar 2023**	**0089_MW227_230314**	**Normal**	**EP2303178**	<0.05	<0.05	<0.02	<0.05	<0.01	0.06	0.06	<1	412	<1	412	33.3	30.2	713	4.87	240		99		65		25		444
HSF	**MW227**	**08 Jun 2023**	**0089_MW227_230608**	**Normal**	**EP2307587**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	360	<1	360	35.6	38.9	852	4.44	208		114		79		31		595
HSF	**MW227**	**05 Sep 2023**	**0089_MW227_230905**	**Normal**	**EP2312187**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	381	<1	381	32.3	27.8	716	7.46	216		90		60		27		407
HSF	**MW228**	**02 Aug 2017**	**0089_MW228_S_170802**	**Normal**	**198991**	<0.005	<0.01	<0.002	<0.05					380					10,000	4.0			360		750		200		6,300
HSF	**MW228**	**11 Sep 2017**	**0089_MW228_S_170911**	**Normal**	**175533**	<0.005	<0.01	<0.002	<0.05																			
HSF	**MW228**	**19 Oct 2017**	**0089_MW228_S_171019**	**Normal**	**178275**	<0.005	<0.01	<0.002	<0.05																			
HSF	**MW228**	**17 Nov 2017**	**0089_MW228_S_171117**	**Normal**	**203443**	<0.005	<0.1	<0.002	<0.05																			
HSF	**MW228**	**05 Dec 2017**	**0089_MW228_S_171205**	**Normal**	**204183**	<0.005	<0.01	<0.002	<0.05																			
HSF	**MW228**	**15 Jan 2018**	**0089_MW228_S_180115**	**Normal**	**205568**	<0.005	<0.01	<0.002	<0.05																			
HSF	**MW228**	**15 Jan 2018**	**0089_QC1MW_180115**	**Field Duplicate**	**205568**	<0.005	<0.01	<0.002	<0.05																			
HSF	**MW228**	**15 Jan 2018**	**0089_QC2MW_180115**	**Interlab Duplicate**	**580891**	<0.05	<0.05	<0.05	<0.05	<0.01	0.14	0.14																	
HSF	**MW228**	**14 Jan 2020**	**0089_MW228_200114**	**Normal**	**EP2000432**	<0.05	<0.05	<0.02	<0.05	<0.01	26.1	26.1	<1	612	<1	612	232	283	6,930	9.94	1,160		294		642		264		4,800
HSF	**MW228**	**01 Apr 2020**	**0089_MW228_200401**	**Normal**	**EP2003417**	<0.05	<0.05	<0.02	<0.05	0.03	32.2	32.2	<1	717	<1	717	310	320	9,490	1.44	1,370		301		724		327		5,440
HSF	**MW228**	**01 Apr 2020**	**0089_QC103_200401**	**Field Duplicate**	**EP2003417**	<0.05	<0.05	<0.02	<0.05	<0.01	11.1	11.1	<1	542	<1	542	328	344	10,200	2.46	1,400		317		789		335		5,860
HSF	**MW228**	**01 Apr 2020**	**0089_QC203_200401**	**Interlab Duplicate**	**711709**	<0.05	<0.05	<0.05	<0.05	<0.01	16.45	16.49	<20	900	<20	900			10,000			260		670		240		5,400	
HSF	**MW228**	**22 Jul 2020**	**0089_MW228_200722**	**Normal**	**EP2007648**	<0.05	<0.05	<0.02	<0.05	<0.01	12.3	12.3	<1	418	<1	418	331	377	10,300	6.53	1,550		325		836		328		6,530
HSF	**MW228**	**22 Jul 2020**	**0089_QC112_200722**	**Field Duplicate**	**EP2007648**	<0.05	<0.05	<0.02	<0.05	<0.01	12.7	12.7	<1	380	<1	380	346	362	10,800	2.33	1,620		321		802		320		6,260
HSF	**MW228**	**22 Jul 2020**	**0089_QC212_200722**	**Interlab Duplicate**	**734409**	<0.05	<0.05	<0.05	<0.05	<0.01	6.39	6.39	<10	450	<20	450			11,000			340		820		240		5,300	
HSF	**MW228**	**21 Sep 2020**	**0089_MW228_200921**	**Normal**	**EP2010085**	<0.05	<0.05	<0.02	<0.05	<0.01	23.6	23.6	<1	505	<1	505	290	279	8,840	1.92	1,460		271		651		256		4,720
HSF	**MW228**	**15 Dec 2020**	**0089_MW228_201215**	**Normal**	**EP2014047**	<0.05	<0.05	<0.02	<0.05	*0.11*	37.1	37.2	<1	419	<1	419	311	321	9,600	1.69	1,510		307		772		296		5,400
HSF	**MW228**	**15 Mar 2021**	**0089_MW228_210315**	**Normal**	**EP2102752**	<0.05	<0.05	<0.02	<0.05	0.03	21.6	21.6	<1	491	<1	491	323	331	10,000	1.28	1,490		299		777		296		5,630
HSF	**MW228**	**10 Jun 2021**	**0089_MW228_210610**	**Normal**	**EP2106588**	<0.05	<0.05	<0.02	<0.05	<0.01	11.6	11.6	<1	328	<1	328	356	355	11,300	0.18	1,500		310		830		324		6,050
HSF	**MW228**	**31 Aug 2021**	**0089_MW228_210831**	**Normal**	**EP2110071**	<0.05	<0.05	<0.02	<0.05	*0.13*	26.4	26.6	<1	606	<1	606	228	241	6,910	2.84	1,010		215		536		202		4,170
HSF	**MW228**	**14 Jan 2022**	**0089_MW228_220114**	**Normal**	**EP2200399**	<0.05	<0.05	<0.02	<0.05	*0.10*	25.9	26.0	<1	549	<1	549	208	215	6,270	1.71	961		196		468		178		3,730
HSF	**MW228**	**16 Mar 2022**	**0089_MW228_220316**	**Normal**	**EP2203057**	<0.05	<0.05	<0.02	<0.05	*0.15*	24.2	24.2	<1	706	<1	706	157	147	4,570	3.36	666		142		334		131		2,500
HSF	**MW228**	**07 Jun 2022**	**0089_MW228_220607**	**Normal**	**EP2206888**	<0.05	<0.05	<0.02	<0.05	*0.09*	18.3	18.3	<1	515	<1	515	243	215	7,410	5.99	1,120		209		490		172		3,680
HSF	**MW228**	**07 Sep 2022**	**0089_MW228_220907**	**Normal**	**EP2211495**	<0.05	<0.05	<0.02	<0.05	*0.12*	8.11	8.17	<1	717	<1	717	95.6	96.0	2,530	0.22	474		117		263		93		1,520
HSF	**MW228**	**13 Dec 2022**	**0089_MW228_221213**	**Normal**	**EP2216929**	<0.05	<0.05	<0.02	<0.05	*0.23*	11.1	11.2	<1	659	<1	659	122	117	3,460	1.86	525		127		305		107		1,910
HSF	**MW228**	**14 Mar 2023**	**0089_MW228_230314**	**Normal**	**EP2303178**	<0.05	<0.05	<0.02	<0.05	*0.19*	13.9	14.0	<1	603	<1	603	156	155	4,540	0.10	745		142		356		126		2,660
HSF	**MW228**	**08 Jun 2023**	**0089_MW228_230608**	**Normal**	**EP2307587**	<0.05	<0.05	<0.02	<0.05	*0.16*	8.90	9.02	<1	581	<1	581	185	212	5,500	6.69	878		232		491		151		3,580
HSF	**MW228**	**05 Sep 2023**	**0089_MW228_230905**	**Normal**	**EP2312187**	<0.05	<0.05	<0.02	<0.05	*0.36*	10.0	10.2	<1	749	<1	749	91.3	87.0	2,380	2.37	440		121		242		92		1,350
Infiltration Swale	**MW233**	**08 Aug 2017**	**0089_MW233_S_170808**	**Normal**	**199212**	<0.005	<0.01	<0.002	<0.05					150					22	-1.5			45		6.9		4		17
Infiltration Swale	**MW233**	**13 Sep 2017**	**0089_MW233_S_170913**	**Normal**	**175739**	<0.005	<0.01	<0.002	<0.05																			
Infiltration Swale	**MW233**	**20 Oct 2017**	**0089_MW233_S_171020**	**Normal**	**178263**	<0.005	<0.1	<0.002	<0.05																			
Infiltration Swale	**MW233**	**21 Nov 2017**	**0089_MW233_S_171121**	**Normal**	**203587**	<0.005	<0.01	<0.002	<0.05																			
Infiltration Swale	**MW233**	**05 Dec 2017**	**0089_MW233_S_171205**	**Normal**	**204183**	<0.005	<0.01	<0.002	<0.05																			
Infiltration Swale	**MW233**	**19 Jan 2018**	**0089_MW233_S_180119**	**Normal**	**205805**	<0.005	<0.01	<0.002	<0.05																			
Infiltration Swale	**MW233**	**08 Jan 2020**	**0089_MW233_200108**	**Normal**	**EP2000182**	<0.05	<0.05	<0.02	<0.05	*0.52*	0.52	0.52	<1	170	<1	170	4.57	4.52	29	0.48	17		58		8		4		20
Infiltration Swale	**MW233**	**30 Mar 2020**	**0089_MW233_200330**	**Normal**	**EP2003313**	<0.05	<0.05	<0.02	<0.05	*0.37*	0.37	0.37	<1	125	<1	125	3.14	3.60	14	6.79	12		48		6		4		14
Infiltration Swale	**MW233**	**15 Jul 2020**	**0089_MW233_200715**	**Normal**	**EP2007385**	<0.05	<0.05	<0.02	<0.05	*0.26*	0.27	0.27	<1	139	<1	139	3.62	3.62	24	0.04	8		48		6		3		15
Infiltration Swale	**MW233**	**15 Jul 2020**	**0089_QC107_200715**	**Field Duplicate**	**EP2007385**	<0.05	<0.05	<0.02	<0.05	*0.24*	0.27	0.27	<1	135	<1	135	3.57	3.39	25	2.63	8		45		5		3		15
Infiltration Swale	**MW233**	**15 Jul 2020**	**0089_QC207_200215**	**Interlab Duplicate**	**732844**	<0.05	<0.05	<0.05	<0.05	*0.2*	0.22	0.23	<10	160	<20	160			21			42		6.1		2.8		16	
Infiltration Swale	**MW233**	**21 Sep 2020**	**0089_MW233_200921**	**Normal**	**EP2010085**	<0.05	<0.05	<0.02	<0.05	*0.29*	0.29	0.29	<1	150	<1	150	3.90	3.83	27	0.97	7		47		6		3		21
Infiltration Swale	**MW233**	**15 Dec 2020**	**0089_MW233_201215**	**Normal**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	*0.25*	0.25	0.25	<1	152	<1	152	3.70	4.17	19	5.97	6		53		7		3		20
Infiltration Swale	**MW233**	**15 Mar 2021**	**0089_MW233_210315**	**Normal**	**EP2102755**	<0.05	<0.05	<0.02	<0.05	*0.21*	0.21	0.21	<1	127	<1	127	3.06	3.49	15	6.53	5		42		6		3		19
Infiltration Swale	**MW233**	**15 Mar 2021**	**0089_QC104_210315**	**Field Duplicate**	**EP2102755**	<0.05	<0.05	<0.02	<0.05	*0.26*	0.26	0.26	<1	136	<1	136	3.30	3.27	17	0.51	5		40		5		3		18
Infiltration Swale	**MW233**	**15 Mar 2021**	**0089_QC204_210315**	**Interlab Duplicate**	**781350**	<0.05	<0.05	<0.05	<0.05	*0.21*	0.22	0.22	<10	150					43			41		5.7		2.5		16	
Infiltration Swale	**MW233**	**09 Jun 2021**	**0089_MW233_210609**	**Normal**	**EP2106515**	<0.05	<0.05	<0.02	<0.05	*0.18*	0.18	0.18	<1	121	<1	121	2.92	3.01	14	1.60	5		38		5		2		15
Infiltration Swale	**MW233**	**30 Aug 2021**	**0089_MW233_210830**	**Normal**	**EP2110016**	<0.05	<0.05	<0.02	<0.05	*0.41*	0.41	0.41	<1	107	<1	107	3.16	3.14	29	0.43	10		40		5		3		15
Infiltration Swale	**MW233**	**30 Aug 2021**	**0089_QC102_210830**	**Field Duplicate**	**EP2110016**	<0.05	<0.05	<0.02	<0.05	*0.37*	0.39	0.39	<1	118	<1	118	3.72	3.78	40	0.94	11		47		6		3		20

Table 1 - Groundwater Analytical Results

						uoroalkyl Sulfonamides				PFAS			Inorganics									Metals							
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																			
PFAS NEMP 2020 Freshwater 99%																													
PFAS NEMP 2020 Recreational Water										**2**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
Infiltration Swale	**MW233**	**30 Aug 2021**	**0089_QC202_210830**	**Interlab Duplicate**	**820919**	<0.05	<0.05	<0.1	<0.05	*0.34*	0.34	0.34																	
Infiltration Swale	**MW233**	**10 Jan 2022**	**0089_MW233_220110**	**Normal**	**EP2200216**	<0.05	<0.05	<0.02	<0.05	*0.35*	0.35	0.35	<1	93	<1	93	3.55	3.01	57	8.23	4		37		4		2		18
Infiltration Swale	**MW233**	**17 Mar 2022**	**0089_MW233_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	*0.25*	0.25	0.25	<1	91	<1	91	3.42	3.16	54	4.03	4		40		4		2		18
Infiltration Swale	**MW233**	**08 Jun 2022**	**0089_MW233_220608**	**Normal**	**EP2206969**	<0.05	<0.05	<0.02	<0.05	*0.12*	0.12	0.12	<1	106	<1	106	2.50	2.50	12	0.02	2		32		4		2		12
Infiltration Swale	**MW233**	**06 Sep 2022**	**0089_MW233_220906**	**Normal**	**EP2211390**	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	107	<1	107	2.75	2.51	18	4.52	5		34		4		2		10
Infiltration Swale	**MW233**	**13 Dec 2022**	**0089_MW233_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	*0.23*	0.23	0.23	<1	152	<1	152	3.88	3.26	24	8.65	8		44		6		2		12
Infiltration Swale	**MW233**	**13 Mar 2023**	**0089_MW233_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	*0.12*	0.12	0.12	<1	118	<1	118	3.39	3.31	33	1.20	5		45		6		2		12
Infiltration Swale	**MW233**	**06 Jun 2023**	**0089_MW233_230606**	**Normal**	**EP2307415**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	93	<1	93	2.50	2.22	20	6.13	4		25		3		1		16
Infiltration Swale	**MW233**	**04 Sep 2023**	**0089_MW233_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	114	<1	114	2.87	2.39	16	9.15	7		29		4		2		13
Fuel Farm	**MW236**	**08 Aug 2017**	**0089_MW236_S_170808**	**Normal**	**199212**	<0.005	<0.01	<0.002	<0.05					280					36	7.1			110		17		0.9		21
Fuel Farm	**MW236**	**13 Sep 2017**	**0089_MW236_S_170913**	**Normal**	**175739**	<0.005	<0.01	<0.002	<0.05																				
Fuel Farm	**MW236**	**20 Oct 2017**	**0089_MW236_S_171020**	**Normal**	**178263**	<0.05	<0.1	<0.02	<0.50																				
Fuel Farm	**MW236**	**21 Nov 2017**	**0089_MW236_S_171121**	**Normal**	**203587**	<0.005	<0.01	<0.002	<0.05																				
Fuel Farm	**MW236**	**05 Dec 2017**	**0089_MW236_S_171205**	**Normal**	**204183**	<0.05	<0.02	<0.02	<0.5																				
Fuel Farm	**MW236**	**19 Jan 2018**	**0089_MW236_S_180119**	**Normal**	**205805**	<0.05	<0.1	<0.02	<0.5																				
Fuel Farm	**MW236**	**02 Apr 2020**	**0089_MW236_200402**	**Normal**	**EP2003472**	<0.05	<0.05	<0.02	<0.05	***87.5***	90.8	94.9	<1	254	<1	254	6.18	6.68	26	3.84	18		94		14		2		18
Fuel Farm	**MW236**	**16 Jul 2020**	**0089_MW236_200716**	**Normal**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	***75.0***	78.1	82.8	<1	342	<1	342	8.17	7.00	32	7.76	21		97		15		2		20
Fuel Farm	**MW236**	**16 Jul 2020**	**0089_QC108_200716**	**Field Duplicate**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	***82.9***	86.3	91.3	<1	268	<1	268	6.72	6.80	33	0.54	21		93		15		2		20
Fuel Farm	**MW236**	**20 Jul 2020**	**0089_QC208_200716**	**Interlab Duplicate**	**733018**	<0.05	<0.05	<0.05	<0.05	***75***	77.65	81.45	<10	330	<20	330			31			100		24		1.5		58	
Fuel Farm	**MW236**	**21 Sep 2020**	**0089_MW236_200921**	**Normal**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	***83.8***	87.6	93.0	<1	260	<1	260	6.65	6.88	36	1.76	21		94		16		2		19
Fuel Farm	**MW236**	**15 Dec 2020**	**0089_MW236_201215**	**Normal**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	***57.5***	60.3	63.4	<1	244	<1	244	6.25	6.71	37	3.53	16		93		15		2		18
Fuel Farm	**MW236**	**16 Mar 2021**	**0089_MW236_210316**	**Normal**	**EP2102833**	<0.05	<0.05	<0.02	<0.05	***71.2***	75.5	80.6	<1	238	<1	238	6.28	7.15	40	6.47	19		95		17		2		22
Fuel Farm	**MW236**	**10 Jun 2021**	**0089_MW236_210610**	**Normal**	**EP2106579**	<0.05	<0.05	<0.02	<0.05	***53.5***	56.1	58.9	<1	243	<1	243	6.20	7.12	36	6.86	16		97		17		2		19
Fuel Farm	**MW236**	**31 Aug 2021**	**0089_MW236_210831**	**Normal**	**EP2110073**	<0.05	<0.05	<0.02	<0.05	***60.8***	65.9	71.1	<1	244	<1	244	7.20	8.42	58	7.82	33		105		19		2		36
Fuel Farm	**MW236**	**10 Jan 2022**	**0089_MW236_220110**	**Normal**	**EP2200211**	<0.05	<0.05	<0.02	<0.05	***84.5***	90.3	95.6	<1	259	<1	259	6.94	6.75	42	1.41	28		89		14		1		26
Fuel Farm	**MW236**	**07 Jun 2022**	**0089_MW236_220607**	**Normal**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	***103***	106	112	<1	280	<1	280	6.75	6.29	24	3.50	23		85		13		1		22
Fuel Farm	**MW236**	**06 Sep 2022**	**0089_MW236_220906**	**Normal**	**EP2211390**	<0.05	<0.05	<0.02	<0.05	***117***	122	127	<1	264	<1	264	6.95	7.06	38	0.77	29		89		17		<1		28
Fuel Farm	**MW236**	**13 Dec 2022**	**0089_MW236_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	***88.2***	91.5	95.3	<1	253	<1	253	6.64	7.08	37	3.18	26		91		16		<1		28
Fuel Farm	**MW236**	**06 Jun 2023**	**0089_MW236_230606**	**Normal**	**EP2307433**	<0.05	<0.05	<0.02	<0.05	***69.3***	72.4	76.2	<1	324	<1	324	7.67	6.53	29	8.02	18		87		16		<1		20
Fuel Farm	**MW236**	**05 Sep 2023**	**0089_MW236_230905**	**Normal**	**EP2312187**	<0.05	<0.05	<0.02	<0.05	***67.7***	70.4	73.8	<1	264	<1	264	6.54	6.43	31	0.86	19		85		15		<1		22
AVCAT Storage	**MW238**	**04 Aug 2017**	**0089_MW238_S_170804**	**Normal**	**199095**	<0.005	<0.01	<0.002	<0.05					200					33	8.4			88		16		2.6		23
AVCAT Storage	**MW238**	**13 Sep 2017**	**0089_MW238_S_170913**	**Normal**	**175739**	<0.005	<0.01	<0.002	<0.05																				
AVCAT Storage	**MW238**	**13 Sep 2017**	**0089_QC1MW_170913**	**Field Duplicate**	**175739**	<0.005	<0.01	<0.002	<0.05																				
AVCAT Storage	**MW238**	**13 Sep 2017**	**0089_QC2MW_170913**	**Interlab Duplicate**	**565731**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
AVCAT Storage	**MW238**	**20 Oct 2017**	**0089_MW238_S_171020**	**Normal**	**178263**	<0.005	<0.1	<0.002	<0.05																				
AVCAT Storage	**MW238**	**21 Nov 2017**	**0089_MW238_S_171121**	**Normal**	**203587**	<0.005	<0.01	<0.002	<0.05																				
AVCAT Storage	**MW238**	**05 Dec 2017**	**0089_MW238_S_171205**	**Normal**	**204183**	<0.005	<0.02	<0.002	<0.05																				
AVCAT Storage	**MW238**	**19 Jan 2018**	**0089_MW238_S_180119**	**Normal**	**205805**	<0.005	<0.01	<0.002	<0.05																				
AVCAT Storage	**MW238**	**14 Jan 2020**	**0089_MW238_200114**	**Normal**	**EP2000432**	<0.05	<0.05	<0.02	<0.05	0.01	0.21	0.21	<1	170	<1	170	7.43	8.38	118	5.98	34		75		18		6		69
AVCAT Storage	**MW238**	**01 Apr 2020**	**0089_MW238_200401**	**Normal**	**EP2003438**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	200	<1	200	6.74	8.03	34	8.69	86		100		19		5		31
AVCAT Storage	**MW238**	**16 Jul 2020**	**0089_MW238_200716**	**Normal**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	215	<1	215	7.05	7.20	38	1.01	81		88		17		4		30
AVCAT Storage	**MW238**	**21 Sep 2020**	**0089_MW238_200921**	**Normal**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	206	<1	206	6.63	7.15	39	3.79	68		88		17		4		29
AVCAT Storage	**MW238**	**30 Sep 2020**	**0089_MW238_200930**	**Normal**	**EP2010524**																40								
AVCAT Storage	**MW238**	**15 Dec 2020**	**0089_MW238_201215**	**Normal**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	190	<1	190	5.87	6.84	38	7.66	48		86		16		4		26
AVCAT Storage	**MW238**	**15 Dec 2020**	**0089_QC114_201215**	**Field Duplicate**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	193	<1	193	6.01	6.70	35	5.42	56		84		16		4		25
AVCAT Storage	**MW238**	**15 Dec 2020**	**0089_QC214_201115**	**Interlab Duplicate**	**765054**	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1	<10	220	<20	220			120			92		19		4.1		41	
AVCAT Storage	**MW238**	**15 Feb 2021**	**0089_MW238_210215**	**Normal**	**EP2101486**																24								
AVCAT Storage	**MW238**	**18 Mar 2021**	**0089_MW238_210318**	**Normal**	**EP2102955**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	189	<1	189	6.44	7.37	34	6.70	82		91		18		5		28
AVCAT Storage	**MW238**	**10 Jun 2021**	**0089_MW238_210610**	**Normal**	**EP2106580**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	198	<1	198	6.60	7.27	42	4.82	70		86		18		4		32
AVCAT Storage	**MW238**	**31 Aug 2021**	**0089_MW238_210831**	**Normal**	**EP2110073**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	180	<1	180	5.44	6.77	47	10.9	25		88		14		2		27
AVCAT Storage	**MW238**	**12 Jan 2022**	**0089_MW238_220112**	**Normal**	**EP2200288**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	193	<1	193	5.84	6.31	41	3.86	40		81		14		3		24
AVCAT Storage	**MW238**	**18 Mar 2022**	**0089_MW238_220318**	**Normal**	**EP2203194**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	206	<1	206	6.79	7.22	38	3.08	77		92		17		4		26
AVCAT Storage	**MW238**	**09 Jun 2022**	**0089_MW238_220609**	**Normal**	**EP2207028**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	208	<1	208	6.82	7.16	39	2.42	75		89		18		4		26
AVCAT Storage	**MW238**	**06 Sep 2022**	**0089_MW238_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	205	<1	205	5.66	6.08	31	3.62	33		78		13		3		24
AVCAT Storage	**MW238**	**13 Dec 2022**	**0089_MW238_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	214	<1	214	6.17	6.90	34	5.59	45		88		15		4		27
AVCAT Storage	**MW238**	**15 Mar 2023**	**0089_MW238_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	208	<1	208	6.76	6.95	42	1.44	68		86		16		5		28
AVCAT Storage	**MW238**	**07 Jun 2023**	**0089_MW238_230607**	**Normal**	**EP2307500**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	219	<1	219	7.03	6.80	41	1.66	72		89		14		3		26
AVCAT Storage	**MW238**	**05 Sep 2023**	**0089_MW238_230905**	**Normal**	**EP2312177**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	238	<1	238	6.37	6.01	30	2.88	37		73		13		5		27
AVCAT Storage	**MW239**	**04 Aug 2017**	**0089_MW239_S_170804**	**Normal**	**199095**	<0.005	<0.01	<0.002	<0.05					240					32	7.3			100		17		2.7		24
AVCAT Storage	**MW239**	**22 Jul 2020**	**0089_MW239_200722**	**Normal**	**EP2007648**	<0.05	<0.05	<0.02	<0.05	<0.01	0.06	0.10	<1	225	<1	225	6.54	7.08	35	3.95	51		93		15		3		26
AVCAT Storage	**MW239**	**21 Sep 2020**	**0089_MW239_200921**	**Normal**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	0.04	0.16	0.24	<1	220	<1	220	6.51	6.84	33	2.44	57		89		15		3		25
AVCAT Storage	**MW239**	**15 Dec 2020**	**0089_MW239_201215**	**Normal**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	0.02	0.10	0.15	<1	221	<1	221	6.64	7.39	31	5.35	65		93		19		4		25
AVCAT Storage	**MW239**	**18 Mar 2021**	**0089_MW239_210318**	**Normal**	**EP2102954**	<0.05	<0.05	<0.02	<0.05	0.04	0.18	0.25	<1	217	<1	217	6.87	7.48	30	4.25	81		88		22		4		27
AVCAT Storage	**MW239**	**10 Jun 2021**	**0089_MW239_210610**	**Normal**	**EP2106579**	<0.05	<0.05	<0.02	<0.05	0.04	0.14	0.21	<1	225	<1	225	7.00	7.26	32	1.82	77		82		23		4		27
AVCAT Storage	**MW239**	**31 Aug 2021**	**0089_MW239_210831**	**Normal**	**EP2110073**	<0.05	<0.05	<0.02	<0.05	<0.01	0.03	0.06	<1	199	<1	199	5.81	6.21	34	3.32	42		78		14		3		25
AVCAT Storage	**MW239**	**12 Jan 2022**	**0089_MW239_220112**	**Normal**	**EP2200288**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	213	<1	213	6.06	5.73	28	2.82	49		75		13		2		20
AVCAT Storage	**MW239**	**18 Mar 2022**	**0089_MW239_220318**	**Normal**	**EP2203194**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.05	<1	238	<1	238	7.41	7.36	32	0.33	84		88		20		4		28
AVCAT Storage	**MW239**	**09 Jun 2022**	**0089_MW239_220609**	**Normal**	**EP2207028**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	230	<1	230	6.54	6.98	32	3.25	50		91		16		3		24
AVCAT Storage	**MW239**	**06 Sep 2022**	**0089_MW239_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	202	<1	202	5.63	5.96	36	2.77	28		81		11		2		22
AVCAT Storage	**MW239**	**13 Dec 2022**	**0089_MW239_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	*0.33*	0.33	0.33	<1	194	<1	194	5.42	5.80	37	3.44	24		80		10		3		21
AVCAT Storage	**MW239**	**15 Mar 2023**	**0089_MW239_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	*0.21*	0.21	0.21	<1	296	<1	296	8.02	6.65	48	9.29	36		85		12		3		31
AVCAT Storage	**MW239**	**07 Jun 2023**	**0089_MW239_230607**	**Normal**	**EP2307500**	<0.05	<0.05	<0.02	<0.05	*0.15*	0.15	0.15	<1	223	<1	223	6.74	6.84	36	0.71	61		98		13		2		19
AVCAT Storage	**MW239**	**05 Sep 2023**	**0089_MW239_230905**	**Normal**	**EP2312177**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	208	<1	208	6.22	6.81	48	4.53	34		81		11		3		41
AVCAT Storage	**MW240**	**04 Aug 2017**	**0089_MW240_S_170804**	**Normal**	**199095**	<0.005	<0.01	<0.002	<0.05					280					43	11			140		16		3.3		26
AVCAT Storage	**MW240**	**14 Jan 2020**	**0089_MW240_200114**	**Normal**	**EP2000432**	<0.05	<0.05	<0.02	<0.05	***5.10***	5.74	6.01	<1	254	<1	254							119		19		5		85
AVCAT Storage	**MW240**	**01 Apr 2020**	**0089_MW240_200401**	**Normal**	**EP2003438**	<0.05	<0.05	<0.02	<0.05	*0.98*	1.08	1.15	<1	320	<1	320	9.00	8.59	51	2.32	56		117		14		3		35
AVCAT Storage	**MW240**	**16 Jul 2020**	**0089_MW240_200716**	**Normal**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	*0.81*	0.89	0.98	<1	262	<1	262	8.11	8.52	46	2.43	76		117		16		4		29
AVCAT Storage	**MW240**	**21 Sep 2020**	**0089_MW240_200921**	**Normal**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	***5.00***	5.60	6.13	<1	267	<1	267	7.74	8.48	47	4.53	52		120		14		3		29
AVCAT Storage	**MW240**	**21 Sep 2020**	**0089_QC106_200921**	**Field Duplicate**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	***3.51***	3.92	4.27	<1	263	<1	263	7.73	8.65	48	5.62	54		123		14		4		29
AVCAT Storage	**MW240**	**21 Sep 2020**	**0089_QC206_200921**	**Interlab Duplicate**	**746269**	<0.05	<0.05	<0.05	<0.05	***2.7***	3.01	3.19	<10	240	<20	240			50			95		26		<5		36	
AVCAT Storage	**MW240**	**15 Dec 2020**	**0089_MW240_201215**	**Normal**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	*1.34*	1.53	1.64	<1	251	<1	251	7.39	8.35	43	6.06	56		120		14		3		26
AVCAT Storage	**MW240**	**18 Mar 2021**	**0089_MW240_210318**	**Normal**	**EP2102954**	<0.05	<0.05	<0.02	<0.05	***3.26***	3.81	4.09	<1	241	<1	241	8.08	9.36	78	7.34	51		131		14		4		36
AVCAT Storage	**MW240**	**10 Jun 2021**	**0089_MW240_210610**	**Normal**	**EP2106580**	<0.05	<0.05	<0.02	<0.05	***3.24***	3.68	4.01	<1	249	<1	249	8.12	9.08	59	5.63	71		124		16		4		34
AVCAT Storage	**MW240**	**31 Aug 2021**	**0089_MW240_210831**	**Normal**	**EP2110073**	<0.05	<0.05	<0.02	<0.05	***4.21***	4.70	5.03	<1	263	<1	263	7.67	8.57	54	5.52	43		122		12		4		32
AVCAT Storage	**MW240**	**12 Jan 2022**	**0089_MW240_220112**	**Normal**	**EP2200288**	<0.05	<0.05	<0.02	<0.05	*0.69*	0.75	0.75	<1	299	<1	299	8.68	7.67	53	6.15	58		108		12		3		28
AVCAT Storage	**MW240**	**12 Jan 2022**	**0089_QC115_220112**	**Field Duplicate**	**EP2200288**	<0.05	<0.05	<0.02	<0.05	*0.69*	0.75	0.75	<1	259	<1	259	6.95	6.50	35	3.35	38									
AVCAT Storage	**MW240**	**12 Jan 2022**	**0089_QC215_220112**	**Interlab Duplicate**	**855202**	<0.05	<0.05	<0.05	<0.05	*0.66*	0.7	0.7																		
AVCAT Storage	**MW240**	**18 Mar 2022**	**0089_MW240_220318**	**Normal**	**EP2203194**	<0.05	<0.05	<0.02	<0.05	*1.07*	1.16	1.16	<1	245	<1	245	8.14	9.41	64	7.25	69		133		15		4		33
AVCAT Storage	**MW240**	**09 Jun 2022**	**0089_MW240_220609**	**Normal**	**EP2207028**	<0.05	<0.05	<0.02	<0.05	***4.46***	4.82	5.13	<1	252	<1	252	8.20	9.52	68	7.44	60		131		16		4		36
AVCAT Storage	**MW240**	**06 Sep 2022**	**0089_MW240_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	***3.80***	4.11	4.17	<1	255	<1	255	7.04	8.00	40	6.43	39		112		12		3		31
AVCAT Storage	**MW240**	**13 Dec 2022**	**0089_MW240_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	*0.77*	0.92	0.92	<1	252	<1	252	6.94	7.32	41	2.66	36		106		10		3		26
AVCAT Storage	**MW240**	**15 Mar 2023**	**0089_MW240_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	***4.45***	4.85	5.15	<1	260	<1	260	7.91	7.51	57	2.54	53		99		11		4		36

Table 1 - Groundwater Analytical Results

						uoroalkyl Sulfonamides				PFAS			Inorganics								Metals							
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																		
PFAS NEMP 2020 Freshwater 99%																												
PFAS NEMP 2020 Recreational Water										**2**																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																							
AVCAT Storage	**MW240**	**07 Jun 2023**	**0089_MW240_230607**	**Normal**	**EP2307500**	<0.05	<0.05	<0.02	<0.05	*0.57*	0.60	0.63	<1	260	<1	260	8.24	7.94	46	1.87	84		113		12		2		29
AVCAT Storage	**MW240**	**05 Sep 2023**	**0089_MW240_230905**	**Normal**	**EP2312187**	<0.05	<0.05	<0.02	<0.05	***2.60***	2.81	2.89	<1	261	<1	261	7.60	6.92	55	4.67	40		92		11		3		31
AVCAT Storage	**MW242**	**07 Aug 2017**	**0089_MW242_S_170807**	**Normal**	**199149**	<0.005	<0.01	<0.002	<0.05					230					43	5.5			90		14		2.6		31
AVCAT Storage	**MW242**	**08 Jan 2020**	**0089_MW242_200108**	**Normal**	**EP2000182**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	185	<1	185	4.70	4.94	18	2.44	24		69		11		1		13
AVCAT Storage	**MW242**	**30 Mar 2020**	**0089_MW242_200330**	**Normal**	**EP2003313**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	181	<1	181	4.81	5.67	23	8.26	26		77		12		4		17
AVCAT Storage	**MW242**	**16 Jul 2020**	**0089_MW242_200716**	**Normal**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	206	<1	206	5.78	5.94	36	1.37	31		79		12		2		22
AVCAT Storage	**MW242**	**21 Sep 2020**	**0089_MW242_200921**	**Normal**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	212	<1	212	6.10	6.51	41	3.27	34		82		14		2		28
AVCAT Storage	**MW242**	**15 Dec 2020**	**0089_MW242_201215**	**Normal**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	198	<1	198	5.58	6.24	36	5.66	29		80		13		2		26
AVCAT Storage	**MW242**	**18 Mar 2021**	**0089_MW242_210318**	**Normal**	**EP2102954**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	183	<1	183	4.94	5.41	25	4.54	28		72		12		2		18
AVCAT Storage	**MW242**	**09 Jun 2021**	**0089_MW242_210609**	**Normal**	**EP2106516**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	188	<1	188	5.53	5.65	40	1.08	31		67		12		4		28
AVCAT Storage	**MW242**	**31 Aug 2021**	**0089_MW242_210831**	**Normal**	**EP2110073**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	210	<1	210	7.69	9.34	87	9.71	50		97		22		5		59
AVCAT Storage	**MW242**	**12 Jan 2022**	**0089_MW242_220112**	**Normal**	**EP2200288**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	194	<1	194	4.84	4.31	15	5.74	26		59		10		1		12
AVCAT Storage	**MW242**	**17 Mar 2022**	**0089_MW242_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	186	<1	186	4.66	4.75	15	0.92	25		66		11		1		12
AVCAT Storage	**MW242**	**08 Jun 2022**	**0089_MW242_220608**	**Normal**	**EP2206969**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	199	<1	199	5.02	5.14	18	1.14	26		70		12		2		14
AVCAT Storage	**MW242**	**06 Sep 2022**	**0089_MW242_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	206	<1	206	6.13	6.66	39	4.13	44		76		17		3		32
AVCAT Storage	**MW242**	**13 Dec 2022**	**0089_MW242_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	193	<1	193	4.79	4.57	14	2.37	26		65		10		1		11
AVCAT Storage	**MW242**	**15 Mar 2023**	**0089_MW242_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	182	<1	182	4.61	3.88	16	8.60	25		52		10		1		10
AVCAT Storage	**MW242**	**06 Jun 2023**	**0089_MW242_230606**	**Normal**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	184	<1	184	4.47	4.06	14	4.76	19		54		11		1		10
AVCAT Storage	**MW242**	**04 Sep 2023**	**0089_MW242_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	184	<1	184	4.66	4.17	18	5.56	23		57		10		1		11
AVCAT Storage	**MW243**	**04 Aug 2017**	**0089_MW243_S_170804**	**Normal**	**199095**	<0.005	<0.01	<0.002	<0.05					300					42	7.1			120		17		3.8		29
AVCAT Storage	**MW243**	**13 Sep 2017**	**0089_MW243_S_170913**	**Normal**	**175739**	<0.005	<0.01	<0.002	<0.05																				
AVCAT Storage	**MW243**	**20 Oct 2017**	**0089_MW243_S_171020**	**Normal**	**178263**	<0.005	<0.1	<0.002	<0.05																				
AVCAT Storage	**MW243**	**21 Nov 2017**	**0089_MW243_S_171121**	**Normal**	**203587**	<0.005	<0.01	<0.002	<0.05																				
AVCAT Storage	**MW243**	**05 Dec 2017**	**0089_MW243_S_171205**	**Normal**	**204183**	<0.005	<0.02	<0.002	<0.05																				
AVCAT Storage	**MW243**	**19 Jan 2018**	**0089_MW243_S_180119**	**Normal**	**205805**	<0.005	<0.01	<0.002	<0.05																				
AVCAT Storage	**MW243**	**14 Jan 2020**	**0089_MW243_200114**	**Normal**	**EP2000432**	<0.05	<0.05	<0.02	<0.05	0.03	0.12	0.12	<1	255	<1	255	7.09	7.38	53	2.01	24		100		13		4		28
AVCAT Storage	**MW243**	**01 Apr 2020**	**0089_MW243_200401**	**Normal**	**EP2003438**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	226	<1	226	6.80	7.35	56	3.85	34		95		13		4		33
AVCAT Storage	**MW243**	**16 Jul 2020**	**0089_MW243_200716**	**Normal**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	*0.09*	0.10	0.10	<1	260	<1	260	7.52	8.00	52	3.16	41		106		14		5		33
AVCAT Storage	**MW243**	**21 Sep 2020**	**0089_MW243_200921**	**Normal**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	255	<1	255	7.44	8.16	58	4.59	34		107		15		4		34
AVCAT Storage	**MW243**	**15 Dec 2020**	**0089_MW243_201215**	**Normal**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	253	<1	253	7.67	8.78	55	6.76	51		117		16		4		35
AVCAT Storage	**MW243**	**18 Mar 2021**	**0089_MW243_210318**	**Normal**	**EP2102955**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	263	<1	263	8.24	9.38	63	6.45	58		122		18		6		38
AVCAT Storage	**MW243**	**10 Jun 2021**	**0089_MW243_210610**	**Normal**	**EP2106579**	<0.05	<0.05	<0.02	<0.05	*0.77*	0.77	0.77	<1	258	<1	258	7.26	8.13	42	5.70	44		106		16		7		31
AVCAT Storage	**MW243**	**31 Aug 2021**	**0089_MW243_210831**	**Normal**	**EP2110073**	<0.05	<0.05	<0.02	<0.05	*0.53*	0.53	0.53	<1	252	<1	252	7.36	8.41	55	6.69	37		112		15		6		33
AVCAT Storage	**MW243**	**12 Jan 2022**	**0089_MW243_220112**	**Normal**	**EP2200288**	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09	<1	246	<1	246	7.15	7.85	55	4.63	33		106		14		4		30
AVCAT Storage	**MW243**	**18 Mar 2022**	**0089_MW243_220318**	**Normal**	**EP2203194**	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	264	<1	264	8.73	10.2	84	7.64	52		128		18		5		50
AVCAT Storage	**MW243**	**09 Jun 2022**	**0089_MW243_220609**	**Normal**	**EP2207028**	<0.05	<0.05	<0.02	<0.05	*0.27*	0.27	0.27	<1	285	<1	285	8.82	9.74	76	4.97	47		123		20		5		42
AVCAT Storage	**MW243**	**06 Sep 2022**	**0089_MW243_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	*0.27*	0.27	0.27	<1	264	<1	264	8.37	9.01	70	3.67	54		116		17		5		39
AVCAT Storage	**MW243**	**13 Dec 2022**	**0089_MW243_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1	268	<1	268	8.17	9.52	65	7.64	47		125		18		4		39
AVCAT Storage	**MW243**	**15 Mar 2023**	**0089_MW243_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09	<1	285	<1	285	9.41	8.89	72	2.83	81		111		17		5		42
AVCAT Storage	**MW243**	**07 Jun 2023**	**0089_MW243_230607**	**Normal**	**EP2307500**	<0.05	<0.05	<0.02	<0.05	*0.18*	0.18	0.18	<1	282	<1	282	9.04	9.22	81	0.99	54		122		17		5		37
AVCAT Storage	**MW243**	**05 Sep 2023**	**0089_MW243_230905**	**Normal**	**EP2312177**	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	309	<1	309	9.18	8.79	57	2.17	67		110		16		6		42
AVCAT Storage	**MW245**	**04 Aug 2017**	**0089_MW245_S_170804**	**Normal**	**199095**	<0.005	<0.01	<0.002	<0.05					550					21	3.7			200		19		2.4		17
AVCAT Storage	**MW245**	**13 Sep 2017**	**0089_MW245_S_170913**	**Normal**	**175739**	<0.005	<0.01	<0.002	<0.05																				
AVCAT Storage	**MW245**	**20 Oct 2017**	**0089_MW245_S_171020**	**Normal**	**178263**	<0.050	<0.1	<0.020	<0.50																				
AVCAT Storage	**MW245**	**21 Nov 2017**	**0089_MW245_S_171121**	**Normal**	**203587**	<0.005	<0.01	<0.002	<0.05																				
AVCAT Storage	**MW245**	**05 Dec 2017**	**0089_MW245_S_171205**	**Normal**	**204183**	<0.005	<0.02	<0.002	<0.05																				
AVCAT Storage	**MW245**	**19 Jan 2018**	**0089_MW245_S_180119**	**Normal**	**205805**	<0.005	<0.01	<0.002	<0.05																				
AVCAT Storage	**MW245**	**14 Jan 2020**	**0089_MW245_200114**	**Normal**	**EP2000432**	<0.05	<0.05	<0.02	<0.05	*0.35*	0.35	0.35	<1	320	<1	320	7.18	7.66	25	3.23	4		110		13		4		23
AVCAT Storage	**MW245**	**01 Apr 2020**	**0089_MW245_200401**	**Normal**	**EP2003438**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	408	<1	408	8.69	10.1	19	7.45	<1		154		16		5		22
AVCAT Storage	**MW245**	**16 Jul 2020**	**0089_MW245_200716**	**Normal**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	*0.34*	0.38	0.38	<1	555	<1	555	12.6	12.7	49	0.58	4		174		18		9		53
AVCAT Storage	**MW245**	**21 Sep 2020**	**0089_MW245_200921**	**Normal**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	*0.32*	0.36	0.36	<1	612	<1	612	13.2	11.6	33	6.27	2		167		19		7		36
AVCAT Storage	**MW245**	**15 Dec 2020**	**0089_MW245_201215**	**Normal**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	*0.18*	0.18	0.18	<1	441	<1	441	9.64	9.39	28	1.31	2		136		15		6		28
AVCAT Storage	**MW245**	**18 Mar 2021**	**0089_MW245_210318**	**Normal**	**EP2102955**	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1	494	<1	494	10.5	9.56	20	4.56	2		142		15		6		25
AVCAT Storage	**MW245**	**10 Jun 2021**	**0089_MW245_210610**	**Normal**	**EP2106579**	<0.05	<0.05	<0.02	<0.05	*0.19*	0.19	0.19	<1	601	<1	601	12.7	12.3	23	1.52	3		187		22		6		24
AVCAT Storage	**MW245**	**31 Aug 2021**	**0089_MW245_210831**	**Normal**	**EP2110073**	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	0.10	<1	315	<1	315	7.56	8.05	33	3.14	16		118		14		2		22
AVCAT Storage	**MW245**	**12 Jan 2022**	**0089_MW245_220112**	**Normal**	**EP2200288**	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09	<1	342	<1	342	7.79	6.75	34	7.19	<1		98		10		3		22
AVCAT Storage	**MW245**	**18 Mar 2022**	**0089_MW245_220318**	**Normal**	**EP2203194**	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1	346	<1	346	7.96	8.22	37	1.64	<2		118		12		5		28
AVCAT Storage	**MW245**	**09 Jun 2022**	**0089_MW245_220609**	**Normal**	**EP2207028**	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	460	<1	460	10.2	10.8	30	2.87	7		152		20		8		31
AVCAT Storage	**MW245**	**06 Sep 2022**	**0089_MW245_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1	304	<1	304	6.83	6.97	21	1.02	8		105		12		2		16
AVCAT Storage	**MW245**	**13 Dec 2022**	**0089_MW245_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	246	<1	246	5.92	5.63	34	2.44	2		83		8		2		18
AVCAT Storage	**MW245**	**15 Mar 2023**	**0089_MW245_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	256	<1	256	6.07	5.08	34	8.92	<1		71		8		2		19
AVCAT Storage	**MW245**	**07 Jun 2023**	**0089_MW245_230607**	**Normal**	**EP2307500**	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	481	<1	481	10.5	10.6	28	0.81	4		160		18		4		25
AVCAT Storage	**MW245**	**05 Sep 2023**	**0089_MW245_230905**	**Normal**	**EP2312177**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	413	<1	413	9.05	9.02	24	0.16	6		138		15		3		19
AVCAT Storage	**MW249**	**07 Aug 2017**	**0089_MW249_S_170807**	**Normal**	**199149**	<0.005	<0.01	<0.002	<0.05					540					300	-2.6			100		36		14		270
AVCAT Storage	**MW249**	**13 Sep 2017**	**0089_MW249_S_170913**	**Normal**	**175739**	<0.005	<0.01	<0.002	<0.05																				
AVCAT Storage	**MW249**	**20 Oct 2017**	**0089_MW249_S_171020**	**Normal**	**178263**	<0.005	<0.1	<0.002	<0.05																				
AVCAT Storage	**MW249**	**21 Nov 2017**	**0089_MW249_S_171121**	**Normal**	**203587**	<0.005	<0.01	<0.002	<0.05																				
AVCAT Storage	**MW249**	**05 Dec 2017**	**0089_MW249_S_171205**	**Normal**	**204183**	<0.005	<0.02	<0.002	<0.05																				
AVCAT Storage	**MW249**	**19 Jan 2018**	**0089_MW249_S_180119**	**Normal**	**205805**	<0.005	<0.01	<0.002	<0.05																				
AVCAT Storage	**MW249**	**08 Jan 2020**	**0089_MW249_200108**	**Normal**	**EP2000182**	<0.05	<0.05	<0.02	<0.05	*0.44*	0.44	0.44	<1	470	<1	470	14.0	12.0	124	7.82	54		85		33		11		109
AVCAT Storage	**MW249**	**30 Mar 2020**	**0089_MW249_200330**	**Normal**	**EP2003313**	<0.05	<0.05	<0.02	<0.05	*0.19*	0.19	0.19	<1	398	<1	398	12.6	13.3	124	2.98	54		105		38		11		108
AVCAT Storage	**MW249**	**16 Jul 2020**	**0089_MW249_200716**	**Normal**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	*0.16*	0.16	0.16	<1	433	<1	433	13.3	12.9	103	1.60	86		104		37		10		102
AVCAT Storage	**MW249**	**16 Jul 2020**	**0089_QC110_200716**	**Field Duplicate**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	*0.20*	0.20	0.20	<1	441	<1	441	13.5	12.5	107	3.95	80		99		35		10		101
AVCAT Storage	**MW249**	**20 Jul 2020**	**0089_QC210_200716**	**Interlab Duplicate**	**733018**	<0.05	<0.05	<0.05	<0.05	*0.14*	0.14	0.14							97			110		35		7.7		100	
AVCAT Storage	**MW249**	**21 Sep 2020**	**0089_MW249_200921**	**Normal**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	*1.29*	1.35	1.38	<1	465	<1	465	15.1	13.5	168	5.48	51		96		34		11		130
AVCAT Storage	**MW249**	**21 Sep 2020**	**0089_QC109_200921**	**Field Duplicate**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	*1.34*	1.40	1.42	<1	468	<1	468	15.3	13.8	170	5.13	57		98		35		11		133
AVCAT Storage	**MW249**	**21 Sep 2020**	**0089_QC209_200921**	**Interlab Duplicate**	**746269**	<0.05	<0.05	<0.05	<0.05	*0.97*	1.01	1.03							150			100		36		8.1		130	
AVCAT Storage	**MW249**	**15 Dec 2020**	**0089_MW249_201215**	**Normal**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	*0.30*	0.30	0.30	<1	449	<1	449	12.3	11.3	103	4.27	22		85		32		9		97
AVCAT Storage	**MW249**	**15 Mar 2021**	**0089_MW249_210315**	**Normal**	**EP2102755**	<0.05	<0.05	<0.02	<0.05	*0.17*	0.17	0.17	<1	418	<1	418	12.6	12.5	130	0.38	29		92		37		11		106
AVCAT Storage	**MW249**	**09 Jun 2021**	**0089_MW249_210609**	**Normal**	**EP2106515**	<0.05	<0.05	<0.02	<0.05	*0.22*	0.22	0.22	<1	435	<1	435	13.4	12.6	150	3.27	25		91		35		10		113
AVCAT Storage	**MW249**	**31 Aug 2021**	**0089_MW249_210831**	**Normal**	**EP2110071**	<0.05	<0.05	<0.02	<0.05	*0.27*	0.29	0.29	<1	426	<1	426	13.5	12.9	130	2.42	64		119		40		3		82
AVCAT Storage	**MW249**	**12 Jan 2022**	**0089_MW249_220112**	**Normal**	**EP2200288**	<0.05	<0.05	<0.02	<0.05	*0.26*	0.30	0.30	<1	431	<1	431	12.8	11.0	118	7.68	40		85		36		7		82
AVCAT Storage	**MW249**	**17 Mar 2022**	**0089_MW249_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	0.10	<1	418	<1	418	12.7	12.7	116	0.15	51		103		42		10		89
AVCAT Storage	**MW249**	**08 Jun 2022**	**0089_MW249_220608**	**Normal**	**EP2206969**	<0.05	<0.05	<0.02	<0.05	*0.24*	0.24	0.26	<1	444	<1	444	14.3	13.9	151	1.31	56		108		48		11		99
AVCAT Storage	**MW249**	**06 Sep 2022**	**0089_MW249_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	*0.23*	0.26	0.26	<1	444	<1	444	14.3	13.3	139	3.43	71		120		42		2		88
AVCAT Storage	**MW249**	**13 Dec 2022**	**0089_MW249_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	*0.32*	0.34	0.34	<1	469	<1	469	13.7	11.7	115	7.95	53		91		37		6		91
AVCAT Storage	**MW249**	**13 Mar 2023**	**0089_MW249_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	*0.28*	0.30	0.30	<1	436	<1	436	14.4	12.4	151	7.39	68		88		41		8		102
AVCAT Storage	**MW249**	**06 Jun 2023**	**0089_MW249_230606**	**Normal**	**EP2307433**	<0.05	<0.05	<0.02	<0.05	*0.24*	0.24	0.24	<1	439	<1	439	14.4	13.1	155	4.75	59		94		38		8		116
AVCAT Storage	**MW249**	**04 Sep 2023**	**0089_MW249_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	*0.36*	0.36	0.36	<1	464	<1	464	14.9	12.9	156	7.00	58		101		42		5		99
AVCAT Storage	**MW249**	**04 Sep 2023**	**0089_QC106_230904**	**Field Duplicate**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	*0.36*	0.36	0.36																		
AVCAT Storage	**MW249**	**04 Sep 2023**	**0089_QC206_230904**	**Interlab Duplicate**	**1023399**	<0.05	<0.05	<0.05	<0.05	*0.37*	0.37	0.37																		
Fire Station	**MW255**	**04 Aug 2017**	**0089_MW255_S_170804**	**Normal**	**199095**	<0.005	<0.01	<0.002	<0.05					380					100	3.9			130		32		2.6		69

Table 1 - Groundwater Analytical Results

						uoroalkyl Sulfonamides				PFAS			Inorganics								Metals							
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																		
PFAS NEMP 2020 Freshwater 99%																												
PFAS NEMP 2020 Recreational Water										**2**																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																							
Fire Station	**MW255**	**13 Sep 2017**	**0089_MW255_S_170913**	**Normal**	**175739**	<0.005	<0.01	<0.002	<0.05																			
Fire Station	**MW255**	**20 Oct 2017**	**0089_MW255_S_171020**	**Normal**	**178263**	<0.005	<0.1	<0.002	<0.05																			
Fire Station	**MW255**	**21 Nov 2017**	**0089_MW255_S_171121**	**Normal**	**203587**	<0.005	<0.01	<0.002	<0.05																			
Fire Station	**MW255**	**08 Dec 2017**	**0089_MW255_S_171208**	**Normal**	**204353**	<0.005	<0.01	<0.002	<0.05																			
Fire Station	**MW255**	**19 Jan 2018**	**0089_MW255_S_180119**	**Normal**	**205805**	<0.005	<0.01	<0.002	<0.05																			
Fire Station	**MW255**	**16 Jul 2020**	**0089_MW255_200716**	**Normal**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	***2.04***	2.59	2.78	<1	454	<1	454	12.0	10.5	76	6.37	36		117		19		5		69
Fire Station	**MW255**	**16 Jul 2020**	**0089_QC109_200716**	**Field Duplicate**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	***2.47***	3.07	3.28	<1	384	<1	384	10.5	10.3	74	0.96	35		113		19		5		68
Fire Station	**MW255**	**20 Jul 2020**	**0089_QC209_200716**	**Interlab Duplicate**	**733018**	<0.05	<0.05	<0.05	<0.05	*1.99*	2.61	2.92							76			130		18		3.5		65	
Fire Station	**MW255**	**22 Sep 2020**	**0089_MW255_200922**	**Normal**	**EP2010141**	<0.05	<0.05	<0.02	<0.05	***15.3***	18.4	20.0	<1	486	<1	486	12.4	10.2	72	9.76	34		103		28		2		63
Fire Station	**MW255**	**22 Sep 2020**	**0089_QC114_200922**	**Field Duplicate**	**EP2010141**	<0.05	<0.05	<0.02	<0.05	***15.6***	19.0	20.2	<1	418	<1	418	11.2	10.4	74	3.50	37		110		25		3		65
Fire Station	**MW255**	**22 Sep 2020**	**0089_QC214_200921**	**Interlab Duplicate**	**746269**	<0.05	<0.05	<0.05	<0.05	***10.59***	12.64	13.57							73			95		22		<5		59	
Fire Station	**MW255**	**16 Dec 2020**	**0089_MW255_201216**	**Normal**	**EP2014106**	<0.05	<0.05	<0.02	<0.05	***3.38***	4.00	4.22	<1	384	<1	384	10.8	10.6	88	0.95	33		116		21		3		70
Fire Station	**MW255**	**17 Mar 2021**	**0089_MW255_210317**	**Normal**	**EP2102900**	<0.05	<0.05	<0.02	<0.05	*1.70*	2.08	2.15	<1	410	<1	410	10.8	9.83	65	4.77	38		106		18		4		68
Fire Station	**MW255**	**10 Jun 2021**	**0089_MW255_210610**	**Normal**	**EP2106580**	<0.05	<0.05	<0.02	<0.05	*1.68*	2.06	2.14	<1	352	<1	352	9.46	9.34	64	0.63	30		98		18		4		66
Fire Station	**MW255**	**31 Aug 2021**	**0089_MW255_210831**	**Normal**	**EP2110073**	<0.05	<0.05	<0.02	<0.05	***7.79***	8.65	9.14	<1	382	<1	382	10.6	10.2	79	1.96	38		106		27		3		61
Fire Station	**MW255**	**10 Jan 2022**	**0089_MW255_220110**	**Normal**	**EP2200211**	<0.05	<0.05	<0.02	<0.05	*1.06*	1.26	1.30	<1	270	<1	270	7.85	7.36	59	3.21	38		82		11		4		52
Fire Station	**MW255**	**17 Mar 2022**	**0089_MW255_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	*0.87*	1.26	1.32	<1	258	<1	258	7.75	8.14	67	2.42	34		92		13		5		54
Fire Station	**MW255**	**09 Jun 2022**	**0089_MW255_220609**	**Normal**	**EP2207028**	<0.05	<0.05	<0.02	<0.05	*1.54*	1.64	1.73	<1	262	<1	262	8.11	8.60	74	2.88	38		97		15		5		55
Fire Station	**MW255**	**06 Sep 2022**	**0089_MW255_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	*1.89*	2.85	3.18	<1	298	<1	298	8.80	8.78	75	0.12	35		91		22		3		54
Fire Station	**MW255**	**13 Dec 2022**	**0089_MW255_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	***11.2***	12.3	12.7	<1	294	<1	294	9.13	8.98	88	0.79	37		102		17		4		55
Fire Station	**MW255**	**13 Mar 2023**	**0089_MW255_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	***5.57***	7.54	7.86	<1	262	<1	262	8.16	7.41	66	4.78	51		85		13		4		46
Fire Station	**MW255**	**06 Jun 2023**	**0089_MW255_230606**	**Normal**	**EP2307433**	<0.05	<0.05	<0.02	<0.05	***7.90***	9.71	10.2	<1	260	<1	260	7.68	7.32	61	2.41	37		83		11		4		50
Fire Station	**MW255**	**05 Sep 2023**	**0089_MW255_230905**	**Normal**	**EP2312187**	<0.05	<0.05	<0.02	<0.05	***12.0***	14.6	15.1	<1	341	<1	341	9.58	8.85	76	3.95	30		90		23		3		55
Fire Station	**MW256**	**04 Aug 2017**	**0089_MW256_S_170804**	**Normal**	**199095**	<0.005	<0.01	<0.002	<0.05					340					33	2.3			120		16		1.4		20
Fire Station	**MW256**	**13 Sep 2017**	**0089_MW256_S_170913**	**Normal**	**175739**	<0.005	<0.01	<0.002	<0.05																			
Fire Station	**MW256**	**20 Oct 2017**	**0089_MW256_S_171020**	**Normal**	**178263**	<0.005	<0.1	<0.002	<0.05																			
Fire Station	**MW256**	**21 Nov 2017**	**0089_MW256_S_171121**	**Normal**	**203587**	<0.005	<0.01	<0.002	<0.05																			
Fire Station	**MW256**	**08 Dec 2017**	**0089_MW256_S_171208**	**Normal**	**204353**	<0.005	<0.01	<0.002	<0.05																			
Fire Station	**MW256**	**19 Jan 2018**	**0089_MW256_S_180119**	**Normal**	**205805**	<0.005	<0.01	<0.002	<0.05																			
Fire Station	**MW256**	**30 Mar 2020**	**0089_MW256_200330**	**Normal**	**EP2003313**	<0.05	<0.05	<0.02	<0.05	***17.2***	23.5	25.2	<1	358	<1	358	18.0	17.3	352	1.95	46		149		41		4		148
Fire Station	**MW256**	**16 Jul 2020**	**0089_MW256_200716**	**Normal**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	***11.9***	15.2	16.4	<1	439	<1	439	11.3	11.3	84	0.02	7		152		20		4		45
Fire Station	**MW256**	**22 Sep 2020**	**0089_MW256_200922**	**Normal**	**EP2010141**	<0.05	<0.05	<0.02	<0.05	***22.0***	27.4	29.0	<1	331	<1	331	10.8	9.42	101	6.59	62		112		15		3		58
Fire Station	**MW256**	**14 Dec 2020**	**0089_MW256_201214**	**Normal**	**EP2013975**	<0.05	<0.05	<0.02	<0.05	***9.80***	12.4	13.0	<1	321	<1	321	12.2	12.4	181	0.42	35		126		18		4		103
Fire Station	**MW256**	**17 Mar 2021**	**0089_MW256_210317**	**Normal**	**EP2102900**	<0.05	<0.05	<0.02	<0.05	***10.2***	12.8	13.4	<1	300	<1	300	13.6	12.7	239	3.23	40		111		17		5		130
Fire Station	**MW256**	**10 Jun 2021**	**0089_MW256_210610**	**Normal**	**EP2106579**	<0.05	<0.05	<0.02	<0.05	***75.0***	84.4	89.7	<1	492	<1	492	15.2	15.1	184	0.32	7		150		41		3		95
Fire Station	**MW256**	**10 Jun 2021**	**0089_QC113_210610**	**Field Duplicate**	**EP2106579**	<0.05	<0.05	<0.02	<0.05	***65.0***	75.0	79.7	<1	499	<1	499	14.8	15.6	164	2.86	9		153		41		3		105
Fire Station	**MW256**	**10 Jun 2021**	**0089_QC213_210610**	**Interlab Duplicate**	**802734**	<0.05	<0.05	<0.05	<0.05	***56***	65.92	72.6	<10	670	<20	670			88			110		26		2.1		50	
Fire Station	**MW256**	**31 Aug 2021**	**0089_MW256_210831**	**Normal**	**EP2110064**	<0.05	<0.05	<0.02	<0.05	***18.4***	24.7	25.9	<1	345	<1	345	19.6	17.3	403	6.27	64		149		27		9		170
Fire Station	**MW256**	**10 Jan 2022**	**0089_MW256_220110**	**Normal**	**EP2200211**	<0.05	<0.05	<0.02	<0.05	***13.2***	19.0	19.9	<1	377	<1	377	17.5	14.3	314	10.2	53		133		26		7		122
Fire Station	**MW256**	**10 Jan 2022**	**0089_QC110_220110**	**Field Duplicate**	**EP2200211**	<0.05	<0.05	<0.02	<0.05	***12.4***	17.8	18.7																	
Fire Station	**MW256**	**10 Jan 2022**	**0089_QC210_220110**	**Interlab Duplicate**	**854607**	<0.05	<0.05	<0.05	<0.05	***12***	15.52	16.76																	
Fire Station	**MW256**	**17 Mar 2022**	**0089_MW256_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	***21.4***	33.8	36.0	<1	473	<1	473	36.2	32.8	867	4.94	109		188		83		8		376
Fire Station	**MW256**	**09 Jun 2022**	**0089_MW256_220609**	**Normal**	**EP2207028**	<0.05	<0.05	<0.02	<0.05	***13.8***	17.0	17.9	<1	516	<1	516	27.8	26.1	585	3.28	49		174		75		8		253
Fire Station	**MW256**	**06 Sep 2022**	**0089_MW256_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	***12.4***	16.0	16.7	<1	430	<1	430	20.0	17.9	372	5.70	46		156		33		8		165
Fire Station	**MW256**	**13 Dec 2022**	**0089_MW256_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	***6.95***	12.4	13.1	<1	426	<1	426	19.6	17.8	347	4.86	64		138		38		9		174
Fire Station	**MW256**	**13 Mar 2023**	**0089_MW256_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	***11.7***	18.8	20.0	<1	506	<1	506	19.8	16.7	299	8.58	61		102		49		3		172
Fire Station	**MW256**	**06 Jun 2023**	**0089_MW256_230606**	**Normal**	**EP2307433**	<0.05	<0.05	<0.02	<0.05	***19.2***	23.4	24.6	<1	525	<1	525	17.6	16.3	239	3.98	19		110		55		5		141
Fire Station	**MW256**	**05 Sep 2023**	**0089_MW256_230905**	**Normal**	**EP2312187**	<0.05	<0.05	<0.02	<0.05	***12.0***	19.8	21.7	<1	427	<1	427	15.0	12.7	210	8.38	26		103		30		6		113
	MW257	**04 Aug 2017**	**0089_MW257_S_170804**	**Normal**	**199095**	<0.005	<0.01	<0.002	<0.05					200					20	1.8			74		8.0		0.8		11
	MW257	**13 Sep 2017**	**0089_MW257_S_170913**	**Normal**	**175739**	<0.005	<0.01	<0.002	<0.05																			
	MW257	**20 Oct 2017**	**0089_MW257_S_171020**	**Normal**	**178263**	<0.005	<0.1	<0.002	<0.05																			
	MW257	**21 Nov 2017**	**0089_MW257_S_171121**	**Normal**	**203587**	<0.005	<0.01	<0.002	<0.05																			
	MW257	**08 Dec 2017**	**0089_MW257_S_171208**	**Normal**	**204353**	<0.005	<0.01	<0.002	<0.05																			
	MW257	**19 Jan 2018**	**0089_MW257_S_180119**	**Normal**	**205805**	<0.005	<0.01	<0.002	<0.05																			
	MW257	**19 Dec 2019**	**0089_MW257_191219**	**Normal**	**EP1913598**	<0.05	<0.05	<0.02	<0.05	*0.09*	0.20	0.20	<1	144	<1	144	4.45	4.75	47	3.20	12		62		7		3		23
	MW257	**02 Apr 2020**	**0089_MW257_200402**	**Normal**	**EP2003472**	<0.05	<0.05	<0.02	<0.05	0.03	0.05	0.05	<1	175	<1	175	5.15	5.80	49	5.96	13		78		8		3		27
	MW257	**16 Jul 2020**	**0089_MW257_200716**	**Normal**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	0.02	0.04	0.07	<1	178	<1	178	4.48	4.35	26	1.47	9		60		6		3		18
	MW257	**22 Sep 2020**	**0089_MW257_200922**	**Normal**	**EP2010141**	<0.05	<0.05	<0.02	<0.05	*0.53*	0.57	0.72	<1	159	<1	159	4.10	4.01	26	1.08	9		52		6		2		20
Flammable / hazardous goods and waste storage area	**MW257**	**16 Dec 2020**	**0089_MW257_201216**	**Normal**	**EP2014106**	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	180	<1	180	5.07	5.30	42	2.16	14		67		8		3		28
	MW257	**18 Mar 2021**	**0089_MW257_210318**	**Normal**	**EP2102954**	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	193	<1	193	5.36	5.76	43	3.58	14		74		8		4		30
	MW257	**09 Jun 2021**	**0089_MW257_210609**	**Normal**	**EP2106516**	<0.05	<0.05	<0.02	<0.05	*0.11*	0.13	0.13	<1	158	<1	158	3.77	4.04	16	3.42	8		57		6		2		15
	MW257	**31 Aug 2021**	**0089_MW257_210831**	**Normal**	**EP2110073**	<0.05	<0.05	<0.02	<0.05	*0.98*	1.21	1.34	<1	111	<1	111	3.24	3.23	29	0.14	10		41		4		3		18
	MW257	**10 Jan 2022**	**0089_MW257_220110**	**Normal**	**EP2200211**	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	197	<1	197	5.47	4.94	39	5.12	21		61		7		4		28
	MW257	**17 Mar 2022**	**0089_MW257_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1	180	<1	180	4.93	5.20	37	2.63	14		68		8		4		24
	MW257	**09 Jun 2022**	**0089_MW257_220609**	**Normal**	**EP2207028**	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	368	<1	368	8.18	4.89	19	25.1	14		66		9		3		18
	MW257	**06 Sep 2022**	**0089_MW257_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	*0.36*	0.47	0.47	<1	115	<1	115	3.18	2.94	27	3.96	6		40		4		2		13
	MW257	**13 Dec 2022**	**0089_MW257_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	*0.38*	0.60	0.60	4	187	<1	191	5.23	5.32	34	0.85	22		66		8		6		28
	MW257	**13 Mar 2023**	**0089_MW257_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	*1.14*	1.45	1.45	<1	222	<1	222	5.83	5.42	37	3.68	17		70		10		4		23
	MW257	**06 Jun 2023**	**0089_MW257_230606**	**Normal**	**EP2307433**	<0.05	<0.05	<0.02	<0.05	*0.48*	0.67	0.67	<1	244	<1	244	5.44	3.83	14	17.4	8		52		8		2		12
	MW257	**05 Sep 2023**	**0089_MW257_230905**	**Normal**	**EP2312187**	<0.05	<0.05	<0.02	<0.05	*0.52*	0.74	0.74	<1	128	<1	128	3.16	3.50	17	5.06	6		51		6		1		10
	MW258	**04 Aug 2017**	**0089_MW258_S_170804**	**Normal**	**199095**	<0.005	<0.01	<0.002	<0.05					320					110	5.9			120		28		11		83
	MW258	**13 Sep 2017**	**0089_MW258_S_170913**	**Normal**	**175739**	<0.005	<0.01	<0.002	<0.05																			
	MW258	**20 Oct 2017**	**0089_MW258_S_171020**	**Normal**	**178263**	<0.05	<0.1	<0.02	<0.5																			
	MW258	**21 Nov 2017**	**0089_MW258_S_171121**	**Normal**	**203587**	<0.005	<0.01	<0.002	<0.05																			
	MW258	**08 Dec 2017**	**0089_MW258_S_171208**	**Normal**	**204353**	<0.005	<0.01	<0.002	<0.05																			
Flammable / hazardous goods and waste storage area	**MW258**	**19 Jan 2018**	**0089_MW258_S_180119**	**Normal**	**205805**	<0.05	<0.1	<0.02	<0.5																			
	MW258	**08 Jun 2022**	**0089_MW258_220608**	**Normal**	**EP2206971**	<0.05	<0.05	<0.02	<0.05	***4.41***	7.80	8.72	<1	353	<1	353	11.1	12.7	80	6.51	88		130		33		14		72
	MW258	**06 Sep 2022**	**0089_MW258_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	***24.8***	46.6	52.3	<1	335	<1	335			120		76		128		27		13		66
	MW258	**13 Dec 2022**	**0089_MW258_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	***11.5***	21.9	24.0	<1	311	<1	311	12.0	13.5	139	5.91	91		141		34		14		77
	MW258	**13 Mar 2023**	**0089_MW258_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	***12.2***	27.5	31.7	<1	397	<1	397	14.4	13.0	156	5.33	100		123		32		19		85
	MW258	**06 Jun 2023**	**0089_MW258_230606**	**Normal**	**EP2307433**	<0.05	<0.05	<0.02	<0.05	***11.8***	22.1	24.4	<1	130	<1	130	12.0	17.6	279	19.0	73		150		50		18		128
	MW258	**05 Sep 2023**	**0089_MW258_230905**	**Normal**	**EP2312187**	<0.05	<0.05	<0.02	<0.05	***4.37***	8.57	9.04	<1	325	<1	325	16.0	15.2	234	2.51	139		130		46		16		104
	MW259	**04 Aug 2017**	**0089_MW259_S_170804**	**Normal**	**199095**	<0.005	<0.01	<0.002	<0.05					260					39	4.7			100		15		4.2		31
	MW259	**13 Sep 2017**	**0089_MW259_S_170913**	**Normal**	**175739**	<0.005	<0.01	<0.002	<0.05																			
	MW259	**20 Oct 2017**	**0089_MW259_S_171020**	**Normal**	**178263**	<0.05	<0.1	<0.02	<0.5																			
	MW259	**21 Nov 2017**	**0089_MW259_S_171121**	**Normal**	**203587**	<0.005	<0.01	<0.002	<0.05																			
	MW259	**08 Dec 2017**	**0089_MW259_S_171208**	**Normal**	**204353**	<0.005	<0.01	<0.002	<0.05																			
	MW259	**19 Jan 2018**	**0089_MW259_S_180119**	**Normal**	**205805**	<0.05	<0.1	<0.02	<0.5																			
	MW259	**16 Jul 2020**	**0089_MW259_200716**	**Normal**	**EP2007438**	<0.05	<0.05	<0.02	<0.05	***3.20***	14.4	15.4	<1	232	<1	232	6.06	6.13	38	0.54	17		79		12		6		24
	MW259	**22 Sep 2020**	**0089_MW259_200922**	**Normal**	**EP2010141**	<0.05	<0.05	<0.02	<0.05	***2.36***	6.54	7.38	<1	238	<1	238	6.22	6.56	41	2.64	15		87		12		4		26
	MW259	**16 Dec 2020**	**0089_MW259_201216**	**Normal**	**EP2014092**	<0.05	<0.05	<0.02	<0.05	*0.51*	0.85	0.92	<1	291	<1	291	7.20	6.51	39	5.05	14		84		13		3		27
	MW259	**18 Mar 2021**	**0089_MW259_210318**	**Normal**	**EP2102954**	<0.05	<0.05	<0.02	<0.05	*0.44*	0.68	0.70	<1	206	<1	206	5.40	5.99	33	5.21	17		75		13		2		26

						uoroalkyl Sulfonamides				PFAS			Inorganics								Metals							
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																			
PFAS NEMP 2020 Freshwater 99%																													
PFAS NEMP 2020 Recreational Water										**2**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																								
Flammable / hazardous goods and waste storage area	**MW259**	**10 Jun 2021**	**0089_MW259_210610**	**Normal**	**EP2106580**	<0.05	<0.05	<0.02	<0.05	*0.54*	0.81	0.85	<1	224	<1	224	5.84	6.08	36	1.96	17		72		15		3		27
	MW259	**31 Aug 2021**	**0089_MW259_210831**	**Normal**	**EP2110073**	<0.05	<0.05	<0.02	<0.05	*0.14*	0.29	0.29	<1	207	<1	207	5.37	5.54	38	1.49	8		70		11		2		25
	MW259	**11 Jan 2022**	**0089_MW259_220111**	**Normal**	**EP2200241**	<0.05	<0.05	<0.02	<0.05	*0.13*	0.15	0.15	<1	170	<1	170	4.08	3.84	20	3.13	6		55		8		<1		10
	MW259	**17 Mar 2022**	**0089_MW259_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	*0.26*	1.36	1.38	<1	185	<1	185	5.24	5.34	42	1.02	17		61		16		1		22
	MW259	**09 Jun 2022**	**0089_MW259_220609**	**Normal**	**EP2207028**	<0.05	<0.05	<0.02	<0.05	*0.11*	0.36	0.36	<1	186	<1	186	4.72	4.63	26	0.95	13		57		14		1		14
	MW259	**06 Sep 2022**	**0089_MW259_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	*0.40*	0.73	0.81	<1	200	<1	200	4.80	4.45	24	3.78	6		62		8		<1		16
	MW259	**13 Dec 2022**	**0089_MW259_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	*0.10*	0.20	0.20	<1	210	<1	210	5.28	5.00	32	2.74	9		68		9		<1		20
	MW259	**13 Mar 2023**	**0089_MW259_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	*0.15*	0.40	0.40	<1	234	<1	234	5.28	4.61	14	6.80	10		67		9		<1		12
	MW259	**06 Jun 2023**	**0089_MW259_230606**	**Normal**	**EP2307433**	<0.05	<0.05	<0.02	<0.05	*0.24*	0.49	0.49	<1	268	<1	268	6.18	5.08	22	9.75	10		68		12		2		15
	MW259	**06 Jun 2023**	**0089_QC102_230606**	**Field Duplicate**	**EP2307433**	<0.05	<0.05	<0.02	<0.05	*0.27*	0.51	0.51																	
	MW259	**06 Jun 2023**	**0089_QC202_230606**	**Interlab Duplicate**	**997465**	<0.05	<0.05	<0.05	<0.05	*0.17*	0.39	0.4																	
	MW259	**05 Sep 2023**	**0089_MW259_230905**	**Normal**	**EP2312187**	<0.05	<0.05	<0.02	<0.05	*0.17*	0.38	0.38	<1	301	<1	301	7.03	7.44	28	2.85	11		106		15		2		20
	MW259	**05 Sep 2023**	**0089_QC117_230905**	**Field Duplicate**	**EP2312187**	<0.05	<0.05	<0.02	<0.05	*0.19*	0.42	0.42	<1	307	<1	307	7.15	7.45	28	2.04	11		107		15		2		19
	MW259	**05 Sep 2023**	**0089_QC217_230905**	**Interlab Duplicate**	**1023399**	<0.05	<0.05	<0.05	<0.05	*0.18*	0.39	0.4																	
Dredge Spoil	**MW268**	**01 Aug 2017**	**0089_MW268_S_170801**	**Normal**	**198918**	<0.005	<0.01	<0.002	<0.05					500					3,000	3.4			200		270		70		1,900
Dredge Spoil	**MW268**	**19 Sep 2017**	**0089_MW268_S_170919**	**Normal**	**176140**	<0.005	<0.01	<0.002	<0.05																				
Dredge Spoil	**MW268**	**16 Oct 2017**	**0089_MW268_S_171016**	**Normal**	**177956**	<0.005	<0.01	<0.002	<0.05																				
Dredge Spoil	**MW268**	**17 Nov 2017**	**0089_MW268_S_171117**	**Normal**	**203443**	<0.005	<0.1	<0.002	<0.05																				
Dredge Spoil	**MW268**	**07 Dec 2017**	**0089_MW268_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																				
Dredge Spoil	**MW268**	**16 Jan 2018**	**0089_MW268_S_180116**	**Normal**	**205631**	<0.005	<0.01	<0.002	<0.05																				
Dredge Spoil	**MW268**	**19 Dec 2019**	**0089_MW268_191219**	**Normal**	**EP1913595**	<0.05	<0.05	<0.02	<0.05	*0.80*	1.12	1.24	<1	458	<1	458	50.0	48.5	974	1.49	642		173		164		32		588
Dredge Spoil	**MW268**	**30 Mar 2020**	**0089_MW268_200330**	**Normal**	**EP2003313**	<0.05	<0.05	<0.02	<0.05	*0.49*	0.64	0.75	<1	563	<1	563	66.4	69.3	1,520	2.09	592		178		200		65		972
Dredge Spoil	**MW268**	**21 Jul 2020**	**0089_MW268_200721**	**Normal**	**EP2007611**	<0.05	<0.05	<0.02	<0.05	*0.39*	0.56	0.68	<1	536	<1	536	89.1	87.1	2,340	1.14	595		187		222		81		1,320
Dredge Spoil	**MW268**	**21 Sep 2020**	**0089_MW268_200921**	**Normal**	**EP2010085**	<0.05	<0.05	<0.02	<0.05	*0.37*	0.51	0.60	<1	460	<1	460	77.6	87.0	1,940	5.69	660		197		228		74		1,300
Dredge Spoil	**MW268**	**14 Dec 2020**	**0089_MW268_201214**	**Normal**	**EP2013975**	<0.05	<0.05	<0.02	<0.05	*0.20*	0.26	0.30	<1	436	<1	436	101	109	2,780	3.83	664		197		273		91		1,710
Dredge Spoil	**MW268**	**16 Mar 2021**	**0089_MW268_210316**	**Normal**	**EP2102837**	<0.05	<0.05	<0.02	<0.05	*0.30*	0.40	0.46	<1	421	<1	421	116	119	3,270	1.54	730		206		292		116		1,890
Dredge Spoil	**MW268**	**16 Mar 2021**	**0089_QC116_210316**	**Field Duplicate**	**EP2102837**	<0.05	<0.05	<0.02	<0.05	*0.26*	0.33	0.38	<1	399	<1	399	143	145	4,220	0.80	772		222		326		121		2,400
Dredge Spoil	**MW268**	**16 Mar 2021**	**0089_QC216_210316**	**Interlab Duplicate**	**781350**	<0.05	<0.05	<0.05	<0.05	*0.31*	0.38	0.44	<10	460					3,100			180		250		68		1,700	
Dredge Spoil	**MW268**	**09 Jun 2021**	**0089_MW268_210609**	**Normal**	**EP2106515**	<0.05	<0.05	<0.02	<0.05	*0.28*	0.39	0.48	<1	413	<1	413	130	128	3,770	0.45	728		211		302		107		2,080
Dredge Spoil	**MW268**	**31 Aug 2021**	**0089_MW268_210831**	**Normal**	**EP2110073**	<0.05	<0.05	<0.02	<0.05	*0.41*	0.51	0.60	<1	474	<1	474	61.1	63.9	1,250	2.24	788		205		211		50		806
Dredge Spoil	**MW268**	**11 Jan 2022**	**0089_MW268_220111**	**Normal**	**EP2200241**	<0.05	<0.05	<0.02	<0.05	*0.41*	0.48	0.55	<1	411	<1	411	45.1	44.6	667	0.52	868		210		204		19		388
Dredge Spoil	**MW268**	**17 Mar 2022**	**0089_MW268_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	*0.35*	0.47	0.53	<1	445	<1	445	53.2	53.3	1,020	0.14	746		210		201		36		584
Dredge Spoil	**MW268**	**09 Jun 2022**	**0089_MW268_220609**	**Normal**	**EP2207028**	<0.05	<0.05	<0.02	<0.05	*0.41*	0.51	0.58	<1	463	<1	463	109	110	3,010	0.26	726		214		285		103		1,680
Dredge Spoil	**MW268**	**06 Sep 2022**	**0089_MW268_220906**	**Normal**	**EP2211390**	<0.05	<0.05	<0.02	<0.05	*0.58*	0.69	0.77	<1	458	<1	458	61.1	65.4	1,340	3.36	680		190		208		51		861
Dredge Spoil	**MW268**	**13 Dec 2022**	**0089_MW268_221213**	**Normal**	**EP2216933**	<0.05	<0.05	<0.02	<0.05	*0.34*	0.41	0.46	<1	434	<1	434	111	111	3,090	0.18	734		218		280		94		1,710
Dredge Spoil	**MW268**	**15 Mar 2023**	**0089_MW268_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	*0.32*	0.43	0.48	<1	460	<1	460	78.1	73.8	1,930	2.81	694		174		214		55		1,060
Dredge Spoil	**MW268**	**06 Jun 2023**	**0089_MW268_230606**	**Normal**	**EP2307433**	<0.05	<0.05	<0.02	<0.05	*0.30*	0.41	0.48	<1	426	<1	426	119	135	3,260	6.50	886		232		320		89		2,190
Dredge Spoil	**MW268**	**04 Sep 2023**	**0089_MW268_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	*0.32*	0.47	0.56	<1	440	<1	440	39.0	39.2	656	0.30	563		162		151		27		415
Dredge Spoil	**MW269**	**01 Aug 2017**	**0089_MW269_S_170801**	**Normal**	**198918**	<0.005	<0.01	<0.002	<0.05					370					270	3.4			90		40		13		220
Dredge Spoil	**MW269**	**19 Sep 2017**	**0089_MW269_S_170919**	**Normal**	**176140**	<0.005	<0.01	<0.002	<0.05																				
Dredge Spoil	**MW269**	**16 Oct 2017**	**0089_MW269_S_171016**	**Normal**	**177956**	<0.005	<0.01	<0.002	<0.05																				
Dredge Spoil	**MW269**	**17 Nov 2017**	**0089_MW269_S_171117**	**Normal**	**203443**	<0.005	<0.1	<0.002	<0.05																				
Dredge Spoil	**MW269**	**07 Dec 2017**	**0089_MW269_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																				
Dredge Spoil	**MW269**	**16 Jan 2018**	**0089_MW269_S_180116**	**Normal**	**205631**	<0.005	<0.01	<0.002	<0.05																				
Dredge Spoil	**MW269**	**19 Dec 2019**	**0089_MW269_191219**	**Normal**	**EP1913595**	<0.05	<0.05	<0.02	<0.05	*1.56*	2.21	2.35	<1	384	<1	384	16.6	14.9	251	5.48	89		52		42		17		193
Dredge Spoil	**MW269**	**30 Mar 2020**	**0089_MW269_200330**	**Normal**	**EP2003313**	<0.05	<0.05	<0.02	<0.05	*1.11*	1.37	1.48	<1	377	<1	377	17.5	16.6	297	2.76	77		71		47		18		200
Dredge Spoil	**MW269**	**21 Jul 2020**	**0089_MW269_200721**	**Normal**	**EP2007611**	<0.05	<0.05	<0.02	<0.05	*0.82*	1.02	1.12	<1	450	<1	450	20.0	18.1	324	4.85	89		68		58		19		218
Dredge Spoil	**MW269**	**21 Sep 2020**	**0089_MW269_200921**	**Normal**	**EP2010085**	<0.05	<0.05	<0.02	<0.05	*1.04*	1.27	1.37	<1	404	<1	404	15.9	15.2	222	2.17	74		74		49		15		163
Dredge Spoil	**MW269**	**14 Dec 2020**	**0089_MW269_201214**	**Normal**	**EP2013975**	<0.05	<0.05	<0.02	<0.05	*0.65*	0.79	0.85	<1	390	<1	390	17.4	16.6	284	2.32	76		73		52		16		190
Dredge Spoil	**MW269**	**16 Mar 2021**	**0089_MW269_210316**	**Normal**	**EP2102837**	<0.05	<0.05	<0.02	<0.05	*1.07*	1.29	1.39	<1	464	<1	464	23.9	25.1	444	2.54	101		88		82		22		309
Dredge Spoil	**MW269**	**09 Jun 2021**	**0089_MW269_210609**	**Normal**	**EP2106515**	<0.05	<0.05	<0.02	<0.05	*1.05*	1.31	1.44	<1	443	<1	443	24.1	21.5	470	5.69	98		73		66		20		275
Dredge Spoil	**MW269**	**31 Aug 2021**	**0089_MW269_210831**	**Normal**	**EP2110073**	<0.05	<0.05	<0.02	<0.05	*1.00*	1.25	1.35	<1	424	<1	424	21.7	19.2	404	5.92	87		77		58		18		234
Dredge Spoil	**MW269**	**11 Jan 2022**	**0089_MW269_220111**	**Normal**	**EP2200241**	<0.05	<0.05	<0.02	<0.05	*0.46*	0.53	0.59	<1	386	<1	386	18.0	15.7	287	6.80	106		98		47		12		153
Dredge Spoil	**MW269**	**17 Mar 2022**	**0089_MW269_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	*1.08*	1.31	1.41	<1	413	<1	413	17.4	16.2	258	3.53	91		90		50		16		166
Dredge Spoil	**MW269**	**09 Jun 2022**	**0089_MW269_220609**	**Normal**	**EP2207028**	<0.05	<0.05	<0.02	<0.05	*1.04*	1.23	1.32	<1	419	<1	419	19.1	17.8	303	3.41	103		76		67		16		186
Dredge Spoil	**MW269**	**06 Sep 2022**	**0089_MW269_220906**	**Normal**	**EP2211390**	<0.05	<0.05	<0.02	<0.05	*1.14*	1.37	1.46	<1	384	<1	384	17.7	16.4	285	3.90	96		68		58		15		180
Dredge Spoil	**MW269**	**13 Dec 2022**	**0089_MW269_221213**	**Normal**	**EP2216933**	<0.05	<0.05	<0.02	<0.05	*0.29*	0.31	0.31	<1	350	<1	350	11.9	11.8	128	0.17	62		110		35		7		76
Dredge Spoil	**MW269**	**15 Mar 2023**	**0089_MW269_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	*0.67*	0.82	0.90	<1	392	<1	392	18.0	15.7	272	6.82	122		74		56		12		164
Dredge Spoil	**MW269**	**06 Jun 2023**	**0089_MW269_230606**	**Normal**	**EP2307433**	<0.05	<0.05	<0.02	<0.05	*0.65*	0.81	0.88	<1	393	<1	393	17.5	16.7	258	2.22	114		68		53		13		199
Dredge Spoil	**MW269**	**04 Sep 2023**	**0089_MW269_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	*0.62*	0.76	0.83	<1	456	<1	456	18.6	15.9	279	7.98	79		69		60		14		164
HSF	**MW282**	**11 Sep 2017**	**0089_MW282_S_170911**	**Normal**	**175533**	<0.05	<0.1	<0.02	<0.5																				
HSF	**MW282**	**16 Oct 2017**	**0089_MW282_S_171016**	**Normal**	**177956**	<0.05	<0.1	<0.02	<1																				
HSF	**MW282**	**17 Nov 2017**	**0089_MW282_S_171117**	**Normal**	**203443**	<0.05	<0.1	<0.02	<0.5																				
HSF	**MW282**	**05 Dec 2017**	**0089_MW282_S_171205**	**Normal**	**204183**	<0.1	<0.2	<0.04	<1																				
HSF	**MW282**	**15 Jan 2018**	**0089_MW282_S_180115**	**Normal**	**205568**	0.01	<0.01	<0.002	<0.05																				
HSF	**MW282**	**19 Dec 2019**	**0089_MW282_191219**	**Normal**	**EP1913595**	<0.05	<0.05	<0.02	<0.05	***243***	278	296	<1	510	<1	510	12.1	12.4	50	1.37	25		176		25		2		36
HSF	**MW282**	**19 Dec 2019**	**0089_QC101_191219**	**Field Duplicate**	**EP1913595**	<0.05	<0.05	<0.02	<0.05	***170***	210	226	<1	478	<1	478	11.5	12.3	50	3.45	26		175		24		2		36
HSF	**MW282**	**31 Mar 2020**	**0089_MW282_200331**	**Normal**	**EP2003366**	<0.05	<0.05	<0.02	<0.05	***123***	171	187	<1	562	<1	562	14.0	16.3	76	7.82	29		216		38		2		55
HSF	**MW282**	**22 Jul 2020**	**0089_MW282_200722**	**Normal**	**EP2007667**	<0.05	<0.05	<0.02	<0.05	***115***	132	144	<1	565	<1	565	13.7	12.3	72	5.38	17		161		19		1		61
HSF	**MW282**	**24 Sep 2020**	**0089_MW282_200924**	**Normal**	**EP2010273**	<0.05	<0.05	<0.02	<0.05	***58.6***	73.9	82.7	<1	490	<1	490	12.5	11.9	84	2.24	16		154		19		<1		62
HSF	**MW282**	**15 Dec 2020**	**0089_MW282_201215**	**Normal**	**EP2014041**	<0.05	<0.05	<0.02	<0.05	***85.3***	111	123	<1	526	<1	526	12.5	13.8	57	4.74	19		187		26		1		52
HSF	**MW282**	**18 Mar 2021**	**0089_MW282_210318**	**Normal**	**EP2102955**	<0.05	<0.05	<0.02	<0.05	***94.0***	122	132	<1	632	<1	632	15.8	16.8	102	2.74	17		222		33		<1		68
HSF	**MW282**	**09 Jun 2021**	**0089_MW282_210609**	**Normal**	**EP2106514**	<0.05	<0.05	<0.02	<0.05	***83.0***	116	127	<1	571	<1	571	14.4	15.0	89	1.94	24		195		30		2		63
HSF	**MW282**	**31 Aug 2021**	**0089_MW282_210831**	**Normal**	**EP2110064**	<0.05	<0.05	<0.02	<0.05	***79.1***	100	108	<1	492	<1	492	11.3	10.3	40	4.51	17		148		20		<1		30
HSF	**MW282**	**13 Jan 2022**	**0089_MW282_220113**	**Normal**	**EP2200339**	<0.05	<0.05	<0.02	<0.05	***143***	164	188	<1	515	<1	515	12.0	11.9	51	0.51	14		176		22		<1		30
HSF	**MW282**	**17 Mar 2022**	**0089_MW282_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	***140***	173	189	<1	544	<1	544	13.0	14.2	62	4.44	20		208		25		1		41
HSF	**MW282**	**08 Jun 2022**	**0089_MW282_220608**	**Normal**	**EP2206971**	<0.05	<0.05	<0.02	<0.05	***95.0***	107	115	<1	535	<1	535	12.5	14.4	54	7.06	16		211		26		<1		41
HSF	**MW282**	**08 Sep 2022**	**0089_MW282_220908**	**Normal**	**EP2211535**	<0.05	<0.05	<0.02	<0.05	***120***	131	142	<1	445	<1	445	9.64	8.94	17	3.80	13		137		16		<1		18
HSF	**MW282**	**13 Dec 2022**	**0089_MW282_221213**	**Normal**	**EP2216933**	<0.05	<0.05	<0.02	<0.05	***108***	126	140	<1	430	<1	430	10.0	11.0	40	4.32	16		164		20		<1		26
HSF	**MW282**	**15 Mar 2023**	**0089_MW282_230315**	**Normal**	**EP2303198**	<0.05	<0.05	<0.02	<0.05	***107***	135	147	<1	517	<1	517	12.4	12.3	55	0.17	24		172		26		2		36
HSF	**MW282**	**08 Jun 2023**	**0089_MW282_230608**	**Normal**	**EP2307586**	<0.05	<0.05	<0.02	<0.05	***119***	136	144	<1	474	<1	474	11.2	11.5	53	1.40	12		178		19		<1		25
Accommodation Area	**MW288**	**18 Sep 2017**	**0089_MW288_S_170918**	**Normal**	**176030**	<0.005	<0.01	<0.002	<0.05																				
Accommodation Area	**MW288**	**17 Oct 2017**	**0089_MW288_S_171017**	**Normal**	**177985**	<0.005	<0.05	<0.002	<0.05																				
Accommodation Area	**MW288**	**15 Nov 2017**	**0089_MW288_S_171115**	**Normal**	**203378**	<0.005	<0.01	<0.002	<0.05																				
Accommodation Area	**MW288**	**07 Dec 2017**	**0089_MW288_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																				
Accommodation Area	**MW288**	**15 Jan 2018**	**0089_MW288_S_180115**	**Normal**	**205568**	<0.005	<0.01	<0.002	<0.05																				
Accommodation Area	**MW288**	**15 Jul 2020**	**0089_MW288_200715**	**Normal**	**EP2007385**	<0.05	<0.05	<0.02	<0.05	***13.1***	13.9	14.2	<1	270	<1	270	11.6	11.0	176	2.49	60		77		29		8		106
Accommodation Area	**MW288**	**17 Mar 2021**	**0089_MW288_210317**	**Normal**	**EP2102900**	<0.05	<0.05	<0.02	<0.05	***6.59***	7.73	8.07	<1	213	<1	213	9.79	10.3	124	2.42	98		57		31		9		107
Accommodation Area	**MW288**	**31 Aug 2021**	**0089_MW288_210831**	**Normal**	**EP2110071**	<0.05	<0.05	<0.02	<0.05	***5.87***	6.36	6.63	<1	272	<1	272	8.98	8.68	85	1.71	55		76		21		6		69
Accommodation Area	**MW288**	**12 Jan 2022**	**0089_MW288_220112**	**Normal**	**EP2200288**	<0.05	<0.05	<0.02	<0.05	***4.62***	4.71	4.74	<1	254	<1	254	7.74	8.35	53	3.81	56		84		22		5		51
Accommodation Area	**MW288**	**18 Mar 2022**	**0089_MW288_220318**	**Normal**	**EP2203194**	<0.05	<0.05	<0.02	<0.05	***3.23***	3.26	3.26	<1	244	<1	244	7.68	8.75	56	6.50	59		97		24		6		41
Accommodation Area	**MW288**	**08 Jun 2022**	**0089_MW288_220608**	**Normal**	**EP2206971**	<0.05	<0.05	<0.02	<0.05	***3.03***	3.05	3.05	<1	271	<1	271	7.85	9.88	54	11.4	44		121		24		5		40

Table 1 - Groundwater Analytical Results

						uoroalkyl Sulfonamides				PFAS			Inorganics								Metals							
						N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.005	0.004	0.002	0.008	0.002	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water										*0.07*																		
PFAS NEMP 2020 Freshwater 99%																												
PFAS NEMP 2020 Recreational Water										**2**																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																							
Accommodation Area	**MW288**	**06 Sep 2022**	**0089_MW288_220906**	**Normal**	**EP2211390**	<0.05	<0.05	<0.02	<0.05	***4.65***	4.65	4.65	<1	316	<1	316	8.63	8.76	52	0.76	41		92		22		4		52
Accommodation Area	**MW288**	**12 Dec 2022**	**0089_MW288_221212**	**Normal**	**EP2216878**	<0.05	<0.05	<0.02	<0.05	*1.88*	1.88	1.88	<1	355	<1	355	9.55	8.99	68	3.01	26		100		25		3		43
Accommodation Area	**MW288**	**14 Mar 2023**	**0089_MW288_230314**	**Normal**	**EP2303178**	<0.05	<0.05	<0.02	<0.05	*1.27*	1.27	1.27	<1	335	<1	335	8.94	7.60	59	8.11	28		85		20		4		37
Accommodation Area	**MW288**	**07 Jun 2023**	**0089_MW288_230607**	**Normal**	**EP2307500**	<0.05	<0.05	<0.02	<0.05	*1.23*	1.23	1.23	<1	309	<1	309	8.82	8.19	71	3.72	31		105		16		6		34
Accommodation Area	**MW288**	**05 Sep 2023**	**0089_MW288_230905**	**Normal**	**EP2312177**	<0.05	<0.05	<0.02	<0.05	*0.64*	0.64	0.64	<1	309	<1	309	7.84	7.07	40	5.18	26		87		15		4		32
Accommodation Area	**MW289**	**18 Sep 2017**	**0089_MW289_S_170918**	**Normal**	**176030**	<0.005	<0.01	<0.002	<0.05																			
Accommodation Area	**MW289**	**17 Oct 2017**	**0089_MW289_S_171017**	**Normal**	**177985**	<0.005	<0.05	<0.002	<0.05																			
Accommodation Area	**MW289**	**15 Nov 2017**	**0089_MW289_S_171115**	**Normal**	**203378**	<0.005	<0.01	<0.002	<0.05																			
Accommodation Area	**MW289**	**07 Dec 2017**	**0089_MW289_S_171207**	**Normal**	**204323**	<0.005	<0.01	<0.002	<0.05																			
Accommodation Area	**MW289**	**15 Jan 2018**	**0089_MW289_S_180115**	**Normal**	**205568**	<0.005	<0.01	<0.002	<0.05																			
Accommodation Area	**MW289**	**30 Mar 2020**	**0089_MW289_200330**	**Normal**	**EP2003313**	<0.05	<0.05	<0.02	<0.05	*0.62*	0.62	0.62	<1	293	<1	293	11.5	12.2	163	2.72	52		128		28		2		79
Accommodation Area	**MW289**	**22 Jul 2020**	**0089_MW289_200722**	**Normal**	**EP2007667**	<0.05	<0.05	<0.02	<0.05	*1.01*	1.07	1.09	<1	319	<1	319	10.7	11.4	107	2.92	65		114		28		7		74
Accommodation Area	**MW289**	**21 Sep 2020**	**0089_MW289_200921**	**Normal**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	***3.08***	3.38	3.55	<1	328	<1	328	9.71	9.81	53	0.49	80		92		27		10		63
Accommodation Area	**MW289**	**21 Sep 2020**	**0089_QC101_200921**	**Field Duplicate**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	***2.32***	2.59	2.75	<1	338	<1	338	10.0	9.85	58	0.81	78		88		27		11		68
Accommodation Area	**MW289**	**21 Sep 2020**	**0089_QC201_200921**	**Interlab Duplicate**	**746269**	<0.05	<0.05	<0.05	<0.05	***2.12***	2.29	2.4	12	580	<20	590			53			83		22		8.1		56	
Accommodation Area	**MW289**	**15 Dec 2020**	**0089_MW289_201215**	**Normal**	**EP2014042**	<0.05	<0.05	<0.02	<0.05	*1.72*	1.81	1.89	<1	321	<1	321	9.02	9.56	46	2.90	63		94		25		8		60
Accommodation Area	**MW289**	**16 Mar 2021**	**0089_MW289_210316**	**Normal**	**EP2102837**	<0.05	<0.05	<0.02	<0.05	*0.97*	0.97	0.97	<1	318	<1	318	8.72	9.76	41	5.64	58		109		24		5		51
Accommodation Area	**MW289**	**09 Jun 2021**	**0089_MW289_210609**	**Normal**	**EP2106516**	<0.05	<0.05	<0.02	<0.05	***2.52***	2.73	2.85	<1	344	<1	344	10.1	10.7	65	2.84	66		93		30		10		76
Accommodation Area	**MW289**	**30 Aug 2021**	**0089_MW289_210830**	**Normal**	**EP2110016**	<0.05	<0.05	<0.02	<0.05	*1.01*	1.07	1.11	<1	308	<1	308	9.18	10.6	68	7.26	53		119		27		4		54
Accommodation Area	**MW289**	**30 Aug 2021**	**0089_QC103_210830**	**Field Duplicate**	**EP2110016**	<0.05	<0.05	<0.02	<0.05	*1.00*	1.06	1.10	<1	290	<1	290	8.87	10.1	67	6.50	57		109		25		5		57
Accommodation Area	**MW289**	**30 Aug 2021**	**0089_QC203_210830**	**Interlab Duplicate**	**820919**	<0.05	<0.05	<0.1	<0.05	*0.84*	0.86	0.91																	
Accommodation Area	**MW289**	**13 Jan 2022**	**0089_MW289_220113**	**Normal**	**EP2200340**	<0.05	<0.05	<0.02	<0.05	*1.47*	1.88	2.00	<1	358	<1	358	11.7	13.2	110	6.09	71		136		33		9		81
Accommodation Area	**MW289**	**17 Mar 2022**	**0089_MW289_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	*0.85*	1.31	1.41	<1	422	<1	422	13.0	14.4	101	5.14	82		153		32		10		89
Accommodation Area	**MW289**	**08 Jun 2022**	**0089_MW289_220608**	**Normal**	**EP2206969**	<0.05	<0.05	<0.02	<0.05	*1.08*	1.63	1.78	<1	396	<1	396	12.2	12.8	99	2.47	70		135		28		5		83
Accommodation Area	**MW289**	**05 Sep 2022**	**0089_MW289_220905**	**Normal**	**EP2211345**	<0.05	<0.05	<0.02	<0.05	***2.20***	2.45	2.55	<1	306	<1	306	9.22	9.07	79	0.82	42		82		20		6		73
Accommodation Area	**MW289**	**13 Dec 2022**	**0089_MW289_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	***2.05***	2.16	2.25	4	281	<1	285	9.41	9.63	91	1.17	55		83		22		6		81
Accommodation Area	**MW289**	**14 Mar 2023**	**0089_MW289_230314**	**Normal**	**EP2303178**	<0.05	<0.05	<0.02	<0.05	***2.84***	3.00	3.12	<1	402	<1	402	13.6	12.0	122	6.06	102		97		31		5		104
Accommodation Area	**MW289**	**06 Jun 2023**	**0089_MW289_230606**	**Normal**	**EP2307415**	<0.05	<0.05	<0.02	<0.05	*1.96*	2.05	2.12	<1	489	<1	489	13.1	9.98	88	13.4	39		85		25		6		81
Accommodation Area	**MW289**	**04 Sep 2023**	**0089_MW289_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	*1.48*	1.57	1.63	<1	528	<1	528	12.9	9.03	52	17.7	44		86		23		6		62
AVCAT Storage	**MW496**	**06 Sep 2022**	**0089_MW496_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	***8.80***	9.30	9.61	<1	428	<1	428	17.0	15.8	221	3.93	109		88		57		13		146
AVCAT Storage	**MW496**	**13 Dec 2022**	**0089_MW496_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	***9.08***	9.39	9.60	4	369	<1	374	14.8	13.4	185	4.84	99		76		41		12		136
AVCAT Storage	**MW496**	**13 Mar 2023**	**0089_MW496_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	***7.49***	7.82	8.00	<1	391	<1	391	17.0	14.2	256	8.94	94		60		33		14		187
AVCAT Storage	**MW496**	**06 Jun 2023**	**0089_MW496_230606**	**Normal**	**EP2307433**	<0.05	<0.05	<0.02	<0.05	***9.22***	9.62	9.83	<1	571	<1	571	19.5	15.7	253	10.7	44		70		39		15		198
AVCAT Storage	**MW496**	**04 Sep 2023**	**0089_MW496_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	***8.51***	8.84	8.99	<1	375	<1	375	14.9	12.8	194	7.30	92		65		38		12		142
FTA	**MW500**	**10 Jan 2022**	**0089_MW500_220110**	**Normal**	**EP2200214**	<0.05	<0.05	<0.02	<0.05	***58.7***	62.3	68.4	<1	295	<1	295	6.86	5.96	24	7.04	14		89		10		<1		16
FTA	**MW500**	**10 Jan 2022**	**0089_QC105_220110**	**Field Duplicate**	**EP2200214**	<0.05	<0.05	<0.02	<0.05	***57.8***	61.2	66.6																	
FTA	**MW500**	**10 Jan 2022**	**0089_QC205_220110**	**Interlab Duplicate**	**854607**	<0.05	<0.05	<0.05	<0.05	***50.9***	52.84	58.84																	
FTA	**MW500**	**14 Mar 2022**	**0089_MW500_220314**	**Normal**	**EP2202975**	<0.05	<0.05	<0.02	<0.05	***56.7***	62.7	66.2	<1	432	<1	432	10.1	10.1	26	0.15	35		149		18		4		24
FTA	**MW500**	**07 Jun 2022**	**0089_MW500_220607**	**Normal**	**EP2206880**	<0.05	<0.05	<0.02	<0.05	***73.5***	82.9	86.9	<1	408	<1	408	9.92	9.26	40	3.45	31		136		17		3		23
FTA	**MW500**	**05 Sep 2022**	**0089_MW500_220905**	**Normal**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	***71.1***	75.4	78.3	<1	303	<1	303	7.41	6.96	34	3.12	19		98		13		<1		23
FTA	**MW500**	**12 Dec 2022**	**0089_MW500_221212**	**Normal**	**EP2216902**	<0.05	<0.05	<0.02	<0.05	***47.9***	50.5	53.7	<1	322	<1	322	7.39	6.56	20	5.96	19		96		12		<1		18
FTA	**MW500**	**13 Mar 2023**	**0089_MW500_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	***38.1***	44.5	50.2	<1	386	<1	386	10.6	8.84	65	9.07	51		128		16		2		25
FTA	**MW500**	**06 Jun 2023**	**0089_MW500_230606**	**Normal**	**EP2307463**	<0.05	<0.05	<0.02	<0.05	***38.1***	40.4	42.2	<1	450	<1	450	11.2	9.84	52	6.60	37		149		14		3		27
FTA	**MW500**	**05 Sep 2023**	**0089_MW500_230905**	**Normal**	**EP2312170**	<0.05	<0.05	<0.02	<0.05	***60.5***	69.5	75.0	<1	425	<1	425	10.9	8.94	59	9.70	34		128		17		1		26
AVCAT Storage	**MW516**	**30 Mar 2020**	**0089_MW516_200330**	**Normal**	**EP2003313**	<0.05	<0.05	<0.02	<0.05	***14.5***	15.2	15.6	<1	436	<1	436	13.8	14.4	138	2.35	56		104		55		16		99
AVCAT Storage	**MW516**	**21 Jul 2020**	**0089_MW516_200721**	**Normal**	**EP2007611**	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	512	<1	512	19.8	18.7	252	3.06	120		137		55		20		156
AVCAT Storage	**MW516**	**21 Sep 2020**	**0089_MW516_200921**	**Normal**	**EP2010077**	<0.05	<0.05	<0.02	<0.05	***13.8***	14.4	14.8	<1	557	<1	557	16.9	15.6	159	4.06	62		139		46		15		103
AVCAT Storage	**MW516**	**16 Dec 2020**	**0089_MW516_201216**	**Normal**	**EP2014087**	<0.05	<0.05	<0.02	<0.05	***6.53***	6.88	7.09	<1	542	<1	542	15.6	15.6	140	0.02	42		156		40		12		98
AVCAT Storage	**MW516**	**18 Mar 2021**	**0089_MW516_210318**	**Normal**	**EP2102954**	<0.05	<0.05	<0.02	<0.05	***12.6***	14.2	14.5	<1	460	<1	460	13.5	14.1	131	2.22	28		144		33		12		89
AVCAT Storage	**MW516**	**09 Jun 2021**	**0089_MW516_210609**	**Normal**	**EP2106515**	<0.05	<0.05	<0.02	<0.05	***10.6***	11.0	11.3	<1	499	<1	499	15.8	15.5	149	0.90	79		147		40		15		104
AVCAT Storage	**MW516**	**31 Aug 2021**	**0089_MW516_210831**	**Normal**	**EP2110073**	<0.05	<0.05	<0.02	<0.05	***6.22***	6.49	6.70	<1	522	<1	522	24.0	24.4	356	0.93	168		225		58		23		180
AVCAT Storage	**MW516**	**12 Jan 2022**	**0089_MW516_220112**	**Normal**	**EP2200288**	<0.05	<0.05	<0.02	<0.05	***10.6***	10.9	11.0	<1	482	<1	482	13.9	12.8	122	4.36	42		108		42		11		84
AVCAT Storage	**MW516**	**17 Mar 2022**	**0089_MW516_220317**	**Normal**	**EP2203138**	<0.05	<0.05	<0.02	<0.05	***9.38***	9.77	9.92	<1	468	<1	468	16.7	16.0	180	1.90	108		128		51		20		114
AVCAT Storage	**MW516**	**08 Jun 2022**	**0089_MW516_220608**	**Normal**	**EP2206969**	<0.05	<0.05	<0.02	<0.05	***11.3***	11.6	11.7	<1	483	<1	483	15.2	15.7	143	1.74	71		130		52		16		104
AVCAT Storage	**MW516**	**06 Sep 2022**	**0089_MW516_220906**	**Normal**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	***6.21***	6.88	7.31	<1	501	<1	501	21.4	20.8	284	1.57	164		138		71		22		172
AVCAT Storage	**MW516**	**13 Dec 2022**	**0089_MW516_221213**	**Normal**	**EP2216932**	<0.05	<0.05	<0.02	<0.05	***2.01***	2.13	2.19	<1	400	<1	400	11.0	10.8	51	1.00	76		94		40		13		57
AVCAT Storage	**MW516**	**13 Mar 2023**	**0089_MW516_230313**	**Normal**	**EP2303119**	<0.05	<0.05	<0.02	<0.05	***5.92***	6.03	6.12	<1	454	<1	454	11.2	9.78	62	6.83	19		88		35		8		53
AVCAT Storage	**MW516**	**06 Jun 2023**	**0089_MW516_230606**	**Normal**	**EP2307433**	<0.05	<0.05	<0.02	<0.05	***9.29***	9.47	9.61	<1	482	<1	482	12.0	11.0	73	4.37	16		92		37		8		73
AVCAT Storage	**MW516**	**04 Sep 2023**	**0089_MW516_230904**	**Normal**	**EP2312225**	<0.05	<0.05	<0.02	<0.05	***5.31***	5.48	5.58	<1	517	<1	517	13.2	12.1	92	4.29	11		103		42		10		74

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Freshwater 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

Table 2 - Porewater Analytical Results

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids												PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sul			
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecano ic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water											*0.56*															
PFAS NEMP 2020 Freshwater 99%					0.00023*						19															
PFAS NEMP 2020 Recreational Water											**10**															
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																					
WWTP	**PW304**	**17 Apr 2018**	**0089_PW304_180417**	**Normal**	**209522**	<0.001	<0.001	0.005	<0.001	0.020	<0.002	0.033	0.10	0.10	0.003	0.003	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
WWTP	**PW304**	**08 Jan 2020**	**0089_PW304_200108**	**Normal**	**EP2000186**	<0.02	<0.02	<0.02	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**01 Apr 2020**	**0089_PW304_200401**	**Normal**	**EP2003438**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**01 Apr 2020**	**0089_QC101_200401**	**Field Duplicate**	**EP2003438**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**01 Apr 2020**	**0089_QC201_200401**	**Interlab Duplicate**	**711709**	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**PW304**	**20 Jul 2020**	**0089_PW304_200720**	**Normal**	**EP2007544**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**22 Sep 2020**	**0089_PW304_200922**	**Normal**	**EP2010143**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**15 Dec 2020**	**0089_PW304_201215**	**Normal**	**EP2014048**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**15 Mar 2021**	**0089_PW304_210315**	**Normal**	**EP2102755**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**10 Jun 2021**	**0089_PW304_210610**	**Normal**	**EP2106582**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**01 Sep 2021**	**0089_PW304_210901**	**Normal**	**EP2110155**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**11 Jan 2022**	**0089_PW304_220111**	**Normal**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**18 Mar 2022**	**0089_PW304_220318**	**Normal**	**EP2203195**	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**08 Jun 2022**	**0089_PW304_220608**	**Normal**	**EP2206973**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**05 Sep 2022**	**0089_PW304_220905**	**Normal**	**EP2211344**	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**12 Dec 2022**	**0089_PW304_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**13 Mar 2023**	**0089_PW304_230313**	**Normal**	**EP2303086**	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**13 Mar 2023**	**0089_QC115_230313**	**Field Duplicate**	**EP2303086**	<0.02	<0.02	0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**13 Mar 2023**	**0089_QC215_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	0.01	<0.01	0.07	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05
WWTP	**PW304**	**07 Jun 2023**	**0089_PW304_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW304**	**05 Sep 2023**	**0089_PW304_230905**	**Normal**	**EP2312178**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**18 Apr 2018**	**0089_PW306_180418**	**Normal**	**209573**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
HSF	**PW306**	**10 Jan 2020**	**0089_PW306_200110**	**Normal**	**EP2000293**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**31 Mar 2020**	**0089_PW306_200331**	**Normal**	**EP2003366**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**22 Jul 2020**	**0089_PW306_200722**	**Normal**	**EP2007648**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**23 Sep 2020**	**0089_PW306_200923**	**Normal**	**EP2010220**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**15 Dec 2020**	**0089_PW306_201215**	**Normal**	**EP2014048**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**17 Mar 2021**	**0089_PW306_210317**	**Normal**	**EP2102892**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**09 Jun 2021**	**0089_PW306_210609**	**Normal**	**EP2106519**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**31 Aug 2021**	**0089_PW306_210831**	**Normal**	**EP2110072**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**13 Jan 2022**	**0089_PW306_220113**	**Normal**	**EP2200338**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**16 Mar 2022**	**0089_PW306_220316**	**Normal**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**07 Jun 2022**	**0089_PW306_220607**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**06 Sep 2022**	**0089_PW306_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**13 Dec 2022**	**0089_PW306_221213**	**Normal**	**EP2217375**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**14 Mar 2023**	**0089_PW306_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**08 Jun 2023**	**0089_PW306_230608**	**Normal**	**EP2307590**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW306**	**04 Sep 2023**	**0089_PW306_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**30 Apr 2018**	**0089_PW307_180430**	**Normal**	**209959**	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
HSF	**PW307**	**10 Jan 2020**	**0089_PW307_200110**	**Normal**	**EP2000293**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**31 Mar 2020**	**0089_PW307_200331**	**Normal**	**EP2003366**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**22 Jul 2020**	**0089_PW307_200722**	**Normal**	**EP2007648**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**23 Sep 2020**	**0089_PW307_200923**	**Normal**	**EP2010220**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**15 Dec 2020**	**0089_PW307_201215**	**Normal**	**EP2014053**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**17 Mar 2021**	**0089_PW307_210317**	**Normal**	**EP2102892**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**09 Jun 2021**	**0089_PW307_210609**	**Normal**	**EP2106519**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**31 Aug 2021**	**0089_PW307_210831**	**Normal**	**EP2110065**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**13 Jan 2022**	**0089_PW307_220113**	**Normal**	**EP2200338**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**16 Mar 2022**	**0089_PW307_220316**	**Normal**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**07 Jun 2022**	**0089_PW307_220607**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**06 Sep 2022**	**0089_PW307_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**13 Dec 2022**	**0089_PW307_221213**	**Normal**	**EP2217375**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**14 Mar 2023**	**0089_PW307_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**08 Jun 2023**	**0089_PW307_230608**	**Normal**	**EP2307590**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW307**	**04 Sep 2023**	**0089_PW307_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**30 Apr 2018**	**0089_PW308_180430**	**Normal**	**209959**	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
HSF	**PW308**	**10 Jan 2020**	**0089_PW308_200110**	**Normal**	**EP2000293**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**01 Apr 2020**	**0089_PW308_200401**	**Normal**	**EP2003417**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**22 Jul 2020**	**0089_PW308_200722**	**Normal**	**EP2007648**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**23 Sep 2020**	**0089_PW308_200923**	**Normal**	**EP2010217**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**15 Dec 2020**	**0089_PW308_201215**	**Normal**	**EP2014053**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**17 Mar 2021**	**0089_PW308_210317**	**Normal**	**EP2102892**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**09 Jun 2021**	**0089_PW308_210609**	**Normal**	**EP2106519**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**31 Aug 2021**	**0089_PW308_210831**	**Normal**	**EP2110072**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**13 Jan 2022**	**0089_PW308_220113**	**Normal**	**EP2200338**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**16 Mar 2022**	**0089_PW308_220316**	**Normal**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**07 Jun 2022**	**0089_PW308_220607**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**06 Sep 2022**	**0089_PW308_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**13 Dec 2022**	**0089_PW308_221213**	**Normal**	**EP2217375**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**14 Mar 2023**	**0089_PW308_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**08 Jun 2023**	**0089_PW308_230608**	**Normal**	**EP2307590**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW308**	**04 Sep 2023**	**0089_PW308_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW314**	**18 Apr 2018**	**0089_PW314_180418**	**Normal**	**209573**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002

Table 2 - Porewater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids												PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sul					
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecano ic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																*0.56*																
PFAS NEMP 2020 Freshwater 99%										0.00023*						19																
PFAS NEMP 2020 Recreational Water																**10**																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																												
HSF	**PW316**	**06 Sep 2022**	**0089_PW316_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW316**	**13 Dec 2022**	**0089_PW316_221213**	**Normal**	**EP2217375**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW316**	**14 Mar 2023**	**0089_PW316_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW316**	**08 Jun 2023**	**0089_PW316_230608**	**Normal**	**EP2307590**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW316**	**04 Sep 2023**	**0089_PW316_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**12 Apr 2018**	**0089_PW329_180412**	**Normal**	**209345**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
Demolition Ground	**PW329**	**10 Jan 2020**	**0089_PW329_200110**	**Normal**	**EP2000252**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**30 Mar 2020**	**0089_PW329_200330**	**Normal**	**EP2003308**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**20 Jul 2020**	**0089_PW329_200720**	**Normal**	**EP2007544**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**23 Sep 2020**	**0089_PW329_200923**	**Normal**	**EP2010217**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**14 Dec 2020**	**0089_PW329_201214**	**Normal**	**EP2013973**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**14 Dec 2020**	**0089_QC102_201214**	**Field Duplicate**	**EP2013973**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**14 Dec 2020**	**0089_QC202_201114**	**Interlab Duplicate**	**765054**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW329**	**16 Mar 2021**	**0089_PW329_210316**	**Normal**	**EP2102836**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**16 Mar 2021**	**0089_QC110_210316**	**Field Duplicate**	**EP2102836**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**16 Mar 2021**	**0089_QC210_210316**	**Interlab Duplicate**	**781350**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW329**	**08 Jun 2021**	**0089_PW329_210608**	**Normal**	**EP2106465**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**08 Jun 2021**	**0089_QC103_210608**	**Field Duplicate**	**EP2106465**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**08 Jun 2021**	**0089_QC203_210608**	**Interlab Duplicate**	**802464**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW329**	**30 Aug 2021**	**0089_PW329_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**10 Jan 2022**	**0089_PW329_220110**	**Normal**	**EP2200218**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**10 Jan 2022**	**0089_QC108_220110**	**Field Duplicate**	**EP2200218**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**10 Jan 2022**	**0089_QC208_220110**	**Interlab Duplicate**	**854607**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW329**	**15 Mar 2022**	**0089_PW329_220315**	**Normal**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**15 Mar 2022**	**0089_QC116_220315**	**Field Duplicate**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**15 Mar 2022**	**0089_QC216_220315**	**Interlab Duplicate**	**872903**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW329**	**08 Jun 2022**	**0089_PW329_220608**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**05 Sep 2022**	**0089_PW329_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**12 Dec 2022**	**0089_PW329_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**14 Mar 2023**	**0089_PW329_230314**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**08 Jun 2023**	**0089_PW329_230608**	**Normal**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW329**	**11 Sep 2023**	**0089_PW329_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**12 Apr 2018**	**0089_PW330_180412**	**Normal**	**209345**	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
Demolition Ground	**PW330**	**10 Jan 2020**	**0089_PW330_200110**	**Normal**	**EP2000252**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**30 Mar 2020**	**0089_PW330_200330**	**Normal**	**EP2003308**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**20 Jul 2020**	**0089_PW330_200720**	**Normal**	**EP2007544**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**22 Sep 2020**	**0089_PW330_200922**	**Normal**	**EP2010151**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**14 Dec 2020**	**0089_PW330_201214**	**Normal**	**EP2013989**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**16 Mar 2021**	**0089_PW330_210316**	**Normal**	**EP2102836**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**08 Jun 2021**	**0089_PW330_210608**	**Normal**	**EP2106465**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**30 Aug 2021**	**0089_PW330_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**10 Jan 2022**	**0089_PW330_220110**	**Normal**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**15 Mar 2022**	**0089_PW330_220315**	**Normal**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**08 Jun 2022**	**0089_PW330_220608**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**08 Jun 2022**	**0089_QC117_220608**	**Field Duplicate**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**08 Jun 2022**	**0089_QC217_220608**	**Interlab Duplicate**	**896805**	<0.002	<0.002	<0.002	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008
Demolition Ground	**PW330**	**05 Sep 2022**	**0089_PW330_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**12 Dec 2022**	**0089_QC105_221212**	**Field Duplicate**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**12 Dec 2022**	**0089_QC205_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW330**	**15 Mar 2023**	**0089_PW330_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**07 Jun 2023**	**0089_PW330_230607**	**Normal**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW330**	**11 Sep 2023**	**0089_PW330_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**12 Apr 2018**	**0089_PW331_180412**	**Normal**	**209345**	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
Demolition Ground	**PW331**	**10 Jan 2020**	**0089_PW331_200110**	**Normal**	**EP2000252**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**30 Mar 2020**	**0089_PW331_200330**	**Normal**	**EP2003308**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**20 Jul 2020**	**0089_PW331_200720**	**Normal**	**EP2007544**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**23 Sep 2020**	**0089_PW331_200923**	**Normal**	**EP2010220**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**14 Dec 2020**	**0089_PW331_201214**	**Normal**	**EP2013973**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**14 Dec 2020**	**0089_QC104_201214**	**Field Duplicate**	**EP2013973**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**14 Dec 2020**	**0089_QC204_201114**	**Interlab Duplicate**	**765054**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW331**	**16 Mar 2021**	**0089_PW331_210316**	**Normal**	**EP2102836**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**08 Jun 2021**	**0089_PW331_210608**	**Normal**	**EP2106465**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**30 Aug 2021**	**0089_PW331_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**10 Jan 2022**	**0089_PW331_220110**	**Normal**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**15 Mar 2022**	**0089_PW331_220315**	**Normal**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**15 Mar 2022**	**0089_QC114_220315**	**Field Duplicate**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**15 Mar 2022**	**0089_QC214_220315**	**Interlab Duplicate**	**872903**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW331**	**08 Jun 2022**	**0089_PW331_220608**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**08 Jun 2022**	**0089_QC118_220608**	**Field Duplicate**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW331**	**08 Jun 2022**	**0089_QC218_220608**	**Interlab Duplicate**	**896805**	<0.002	<0.002	<0.002	<0.002	0.006	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008
Demolition Ground	**PW331**	**05 Sep 2022**	**0089_PW331_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01

Table 2 - Porewater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids												PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sul							
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecano ic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide Metabolite (NMeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																*0.56*																			
PFAS NEMP 2020 Freshwater 99%										0.00023*						19																			
PFAS NEMP 2020 Recreational Water																**10**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																															
FTA	**PW341**	**08 Jan 2020**	**0089_QC206_200108**	**Interlab Duplicate**	**696100**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
FTA	**PW341**	**31 Mar 2020**	**0089_PW341_200331**	**Normal**	**EP2003364**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**15 Jul 2020**	**0089_PW341_200715**	**Normal**	**EP2007383**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**22 Sep 2020**	**0089_PW341_200922**	**Normal**	**EP2010151**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**22 Sep 2020**	**0089_QC115_200922**	**Field Duplicate**	**EP2010151**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**22 Sep 2020**	**0089_QC215_200921**	**Interlab Duplicate**	**746269**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
FTA	**PW341**	**14 Dec 2020**	**0089_PW341_201214**	**Normal**	**EP2013988**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**15 Mar 2021**	**0089_PW341_210315**	**Normal**	**EP2102752**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**08 Jun 2021**	**0089_PW341_210608**	**Normal**	**EP2106450**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**30 Aug 2021**	**0089_PW341_210830**	**Normal**	**EP2110021**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**10 Jan 2022**	**0089_PW341_220110**	**Normal**	**EP2200212**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**14 Mar 2022**	**0089_PW341_220314**	**Normal**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**07 Jun 2022**	**0089_PW341_220607**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**05 Sep 2022**	**0089_PW341_220905**	**Normal**	**EP2211344**	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**12 Dec 2022**	**0089_PW341_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**13 Mar 2023**	**0089_PW341_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**07 Jun 2023**	**0089_PW341_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW341**	**05 Sep 2023**	**0089_PW341_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**13 Apr 2018**	**0089_PW345_180413**	**Normal**	**209417**	0.021	0.020	0.11	0.004	0.034	<0.002	0.027	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
WWTP	**PW345**	**09 Jan 2020**	**0089_PW345_200109**	**Normal**	**EP2000249**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**31 Mar 2020**	**0089_PW345_200331**	**Normal**	**EP2003374**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**24 Sep 2020**	**0089_PW345_200924**	**Normal**	**EP2010271**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**15 Dec 2020**	**0089_PW345_201215**	**Normal**	**EP2014053**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**16 Mar 2021**	**0089_PW345_210316**	**Normal**	**EP2102834**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**09 Jun 2021**	**0089_PW345_210609**	**Normal**	**EP2106517**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**01 Sep 2021**	**0089_PW345_210901**	**Normal**	**EP2110154**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**10 Jan 2022**	**0089_PW345_220110**	**Normal**	**EP2200215**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**10 Jan 2022**	**0089_QC111_220110**	**Field Duplicate**	**EP2200215**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**10 Jan 2022**	**0089_QC211_220110**	**Interlab Duplicate**	**854607**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
WWTP	**PW345**	**14 Mar 2022**	**0089_PW345_220314**	**Normal**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.19	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**07 Jun 2022**	**0089_PW345_220607**	**Normal**	**EP2206884**	<0.02	<0.02	0.03	<0.02	0.47	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**05 Sep 2022**	**0089_PW345_220905**	**Normal**	**EP2211341**	<0.02	<0.02	<0.01	<0.02	-	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**13 Dec 2022**	**0089_PW345_221213**	**Normal**	**EP2216930**	<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**14 Mar 2023**	**0089_PW345_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**07 Jun 2023**	**0089_PW345_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW345**	**05 Sep 2023**	**0089_PW345_230905**	**Normal**	**EP2312172**	<0.02	<0.02	<0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**17 Apr 2018**	**0089_PW346_180417**	**Normal**	**209522**	<0.01	<0.01	0.006	<0.01	0.013	<0.002	0.005	<0.002	<0.001	<0.001	<0.001	0.001	<0.001	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
Accommodation Area	**PW346**	**08 Jan 2020**	**0089_PW346_200108**	**Normal**	**EP2000186**	0.03	0.04	0.38	0.03	1.85	<0.02	<0.1	<0.02	0.05	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**01 Apr 2020**	**0089_PW346_200401**	**Normal**	**EP2003438**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**15 Jul 2020**	**0089_PW346_200715**	**Normal**	**EP2007386**	<0.02	<0.02	0.03	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**22 Sep 2020**	**0089_PW346_200922**	**Normal**	**EP2010143**	0.06	0.06	0.65	0.06	4.97	<0.02	<0.1	0.02	0.10	0.03	0.06	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**15 Dec 2020**	**0089_PW346_201215**	**Normal**	**EP2014044**	0.07	0.07	0.45	0.03	2.71	<0.02	<0.1	<0.02	0.10	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**17 Mar 2021**	**0089_PW346_210317**	**Normal**	**EP2102901**	0.03	<0.02	0.07	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**10 Jun 2021**	**0089_PW346_210610**	**Normal**	**EP2106580**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**30 Aug 2021**	**0089_PW346_210830**	**Normal**	**EP2110017**	<0.02	<0.02	0.05	<0.02	0.34	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**12 Jan 2022**	**0089_PW346_220112**	**Normal**	**EP2200289**	0.04	0.03	0.25	<0.02	1.84	<0.02	<0.1	<0.02	0.05	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**18 Mar 2022**	**0089_PW346_220318**	**Normal**	**EP2203195**	0.04	0.06	0.64	<0.02	1.12	<0.02	<0.1	<0.02	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**08 Jun 2022**	**0089_PW346_220608**	**Normal**	**EP2206973**	<0.02	<0.02	0.06	<0.02	0.42	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**06 Sep 2022**	**0089_PW346_220906**	**Normal**	**EP2211391**	<0.02	<0.02	0.04	<0.02	0.11	<0.02	0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**12 Dec 2022**	**0089_PW346_221212**	**Normal**	**EP2216879**	0.04	0.04	0.33	0.05	5.54	<0.02	<0.1	0.03	0.07	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**12 Dec 2022**	**0089_QC118_221212**	**Field Duplicate**	**EP2216879**	0.06	0.05	0.44	0.07	6.88	<0.02	<0.1	0.05	0.10	0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**12 Dec 2022**	**0089_QC218_221212**	**Interlab Duplicate**	**950091**	0.05	0.04	0.42	0.09	7.1	<0.01	<0.05	0.04	0.10	0.03	0.06	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
Accommodation Area	**PW346**	**14 Mar 2023**	**0089_PW346_230314**	**Normal**	**EP2303179**	<0.02	<0.02	0.01	<0.02	0.22	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**14 Mar 2023**	**0089_QC118_230314**	**Field Duplicate**	**EP2303179**	<0.02	<0.02	0.02	<0.02	0.41	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**14 Mar 2023**	**0089_QC218_230314**	**Interlab Duplicate**	**972487**	<0.01	<0.01	0.02	<0.01	0.28	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
Accommodation Area	**PW346**	**07 Jun 2023**	**0089_PW346_230607**	**Normal**	**EP2307502**	<0.02	<0.02	0.04	<0.02	0.55	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Accommodation Area	**PW346**	**05 Sep 2023**	**0089_PW346_230905**	**Normal**	**EP2312178**	<0.02	<0.02	0.02	<0.02	0.24	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW350**	**19 Apr 2018**	**0089_PW350_180419**	**Normal**	**209623**	0.94	0.64	4.3	0.27	0.14	<0.002	0.16	0.25	1.4	0.13	0.27	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
WWTP	**PW350**	**30 Jan 2020**	**0089_PW350_200130**	**Normal**	**EP2001003**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW350**	**02 Apr 2020**	**0089_PW350_200402**	**Normal**	**EP2003476**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW350**	**21 Jul 2020**	**0089_PW350_200721**	**Normal**	**EP2007594**	<0.02	<0.02	0.02	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW350**	**23 Sep 2020**	**0089_PW350_200923**	**Normal**	**EP2010220**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW350**	**16 Dec 2020**	**0089_PW350_201216**	**Normal**	**EP2014090**	<0.02	<0.02	<0.02	<0.02	-	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW350**	**17 Mar 2021**	**0089_PW350_210317**	**Normal**	**EP2102901**	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW350**	**08 Jun 2021**	**0089_PW350_210608**	**Normal**	**EP2106450**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW350**	**30 Aug 2021**	**0089_PW350_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW350**	**11 Jan 2022**	**0089_PW350_220111**	**Normal**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW350**	**14 Mar 2022**	**0089_PW350_220314**	**Normal**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW350**	**07 Jun 2022**	**0089_PW350_220607**	**Normal**	**EP2206884**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW350**	**07 Sep 2022**	**0089_PW350_220907**	**Normal**	**EP2211496**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1

Table 2 - Porewater Analytical Results

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sul			
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide Metod 537 (NMeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water											*0.56*															
PFAS NEMP 2020 Freshwater 99%					0.00023*						19															
PFAS NEMP 2020 Recreational Water											**10**															
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																					
Demolition Ground	**PW356**	**15 Mar 2023**	**0089_PW356_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW356**	**07 Jun 2023**	**0089_PW356_230607**	**Normal**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW356**	**07 Jun 2023**	**0089_QC116_230607**	**Field Duplicate**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW356**	**07 Jun 2023**	**0089_QC216_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW356**	**11 Sep 2023**	**0089_PW356_230911**	**Normal**	**EP2312525**	<0.02	<0.03	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**12 Apr 2018**	**0089_PW357_180412**	**Normal**	**209345**	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
Demolition Ground	**PW357**	**09 Jan 2020**	**0089_QC203_200109**	**Interlab Duplicate**	**696324**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW357**	**10 Jan 2020**	**0089_PW357_200110**	**Normal**	**EP2000252**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**10 Jan 2020**	**0089_QC103_200110**	**Field Duplicate**	**EP2000252**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**30 Mar 2020**	**0089_PW357_200330**	**Normal**	**EP2003308**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**20 Jul 2020**	**0089_PW357_200720**	**Normal**	**EP2007544**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**23 Sep 2020**	**0089_PW357_200923**	**Normal**	**EP2010220**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**14 Dec 2020**	**0089_PW357_201214**	**Normal**	**EP2013989**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**16 Mar 2021**	**0089_PW357_210316**	**Normal**	**EP2102836**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**08 Jun 2021**	**0089_PW357_210608**	**Normal**	**EP2106465**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**30 Aug 2021**	**0089_PW357_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**10 Jan 2022**	**0089_PW357_220110**	**Normal**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**15 Mar 2022**	**0089_PW357_220315**	**Normal**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**15 Mar 2022**	**0089_QC118_220315**	**Field Duplicate**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**15 Mar 2022**	**0089_QC218_220315**	**Interlab Duplicate**	**872903**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW357**	**08 Jun 2022**	**0089_PW357_220608**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**08 Jun 2022**	**0089_PW357_220608**	**Normal**	**EP2208241**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**05 Sep 2022**	**0089_PW357_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW357**	**12 Dec 2022**	**0089_PW357_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW358**	**15 Mar 2023**	**0089_PW358_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW358**	**07 Jun 2023**	**0089_PW358_230607**	**Normal**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Demolition Ground	**PW358**	**11 Sep 2023**	**0089_PW358_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**13 Apr 2018**	**0089_PW362_180413**	**Normal**	**209417**	0.003	<0.001	0.006	<0.001	0.009	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
FTA	**PW362**	**08 Jan 2020**	**0089_PW362_200108**	**Normal**	**EP2000179**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**31 Mar 2020**	**0089_PW362_200331**	**Normal**	**EP2003364**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**15 Jul 2020**	**0089_PW362_200715**	**Normal**	**EP2007383**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**22 Sep 2020**	**0089_PW362_200922**	**Normal**	**EP2010151**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**14 Dec 2020**	**0089_PW362_201214**	**Normal**	**EP2013988**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**15 Mar 2021**	**0089_PW362_210315**	**Normal**	**EP2102758**	<0.02	<0.02	<0.02	<0.02	0.23	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**08 Jun 2021**	**0089_PW362_210608**	**Normal**	**EP2106450**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**30 Aug 2021**	**0089_PW362_210830**	**Normal**	**EP2110021**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**10 Jan 2022**	**0089_PW362_220110**	**Normal**	**EP2200212**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**14 Mar 2022**	**0089_PW362_220314**	**Normal**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**07 Jun 2022**	**0089_PW362_220607**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**07 Jun 2022**	**0089_QC110_220607**	**Field Duplicate**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**07 Jun 2022**	**0089_QC210_220607**	**Interlab Duplicate**	**896805**	<0.002	<0.002	0.003	<0.002	0.028	<0.004	<0.008	<0.003	<0.001	<0.004	0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.004	<0.008
FTA	**PW362**	**05 Sep 2022**	**0089_PW362_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**05 Sep 2022**	**0089_QC108_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**05 Sep 2022**	**0089_QC208_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
FTA	**PW362**	**12 Dec 2022**	**0089_PW362_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**12 Dec 2022**	**0089_QC107_221212**	**Field Duplicate**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**12 Dec 2022**	**0089_QC207_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
FTA	**PW362**	**13 Mar 2023**	**0089_PW362_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**13 Mar 2023**	**0089_QC109_230313**	**Field Duplicate**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**13 Mar 2023**	**0089_QC209_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
FTA	**PW362**	**07 Jun 2023**	**0089_PW362_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW362**	**05 Sep 2023**	**0089_PW362_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**13 Apr 2018**	**0089_PW363_180413**	**Normal**	**209417**	<0.001	<0.001	0.004	<0.001	0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
FTA	**PW363**	**08 Jan 2020**	**0089_PW363_200108**	**Normal**	**EP2000179**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**31 Mar 2020**	**0089_PW363_200331**	**Normal**	**EP2003364**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**15 Jul 2020**	**0089_PW363_200715**	**Normal**	**EP2007383**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**22 Sep 2020**	**0089_PW363_200922**	**Normal**	**EP2010151**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**14 Dec 2020**	**0089_PW363_201214**	**Normal**	**EP2013988**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	0.25	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**15 Mar 2021**	**0089_PW363_210315**	**Normal**	**EP2102752**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**08 Jun 2021**	**0089_PW363_210608**	**Normal**	**EP2106450**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**30 Aug 2021**	**0089_PW363_210830**	**Normal**	**EP2110021**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**10 Jan 2022**	**0089_PW363_220110**	**Normal**	**EP2200212**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**14 Mar 2022**	**0089_PW363_220314**	**Normal**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**07 Jun 2022**	**0089_PW363_220607**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**05 Sep 2022**	**0089_PW363_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**12 Dec 2022**	**0089_PW363_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**13 Mar 2023**	**0089_PW363_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**07 Jun 2023**	**0089_PW363_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW363**	**05 Sep 2023**	**0089_PW363_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW364**	**13 Apr 2018**	**0089_PW364_180413**	**Normal**	**209417**	<0.001	<0.001	0.006	<0.001	0.017	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
FTA	**PW364**	**09 Jan 2020**	**0089_PW364_200109**	**Normal**	**EP2000249**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
FTA	**PW364**	**30 Mar 2020**	**0089_PW364_200330**	**Normal**	**EP2003333**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
**FTA

Table 2 - Porewater Analytical Results

					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids												PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sul					
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane Sulfonamide (FOSA)	N-Methyl perfluorooctane Sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water															*0.56*															
PFAS NEMP 2020 Freshwater 99%									0.00023*						19															
PFAS NEMP 2020 Recreational Water															**10**															
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																											
WWTP	**PW367**	**11 Jan 2022**	**0089_QC113_220111**	**Field Duplicate**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW367**	**11 Jan 2022**	**0089_QC213_220111**	**Interlab Duplicate**	**855202**	<0.01	<0.01	<0.01	<0.01	0.08	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
WWTP	**PW367**	**11 Jan 2022**	**0089-PW367_220111**	**Normal**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW367**	**14 Mar 2022**	**0089_PW367_220314**	**Normal**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW367**	**07 Jun 2022**	**0089_PW367_220607**	**Normal**	**EP2206884**	<0.02	<0.02	0.03	<0.02	0.27	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW367**	**05 Sep 2022**	**0089_PW367_220905**	**Normal**	**EP2211341**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW367**	**05 Sep 2022**	**0089_QC110_220905**	**Field Duplicate**	**EP2211341**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW367**	**05 Sep 2022**	**0089_QC210_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
WWTP	**PW367**	**13 Dec 2022**	**0089_PW367_221213**	**Normal**	**EP2216930**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW367**	**14 Mar 2023**	**0089_PW367_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW367**	**07 Jun 2023**	**0089_PW367_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW367**	**07 Jun 2023**	**0089_QC111_230607**	**Field Duplicate**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW367**	**07 Jun 2023**	**0089_QC211_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.11	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**PW367**	**05 Sep 2023**	**0089_PW367_230905**	**Normal**	**EP2312172**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**17 Apr 2018**	**0089_PW368_180417**	**Normal**	**209522**	0.003	0.002	0.014	0.001	0.040	<0.002	0.026	0.006	0.016	0.003	0.009	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.002	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
WWTP	**PW368**	**08 Jan 2020**	**0089_PW368_200108**	**Normal**	**EP2000186**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**01 Apr 2020**	**0089_PW368_200401**	**Normal**	**EP2003438**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**01 Apr 2020**	**0089_QC102_200401**	**Field Duplicate**	**EP2003438**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**01 Apr 2020**	**0089_QC202_200401**	**Interlab Duplicate**	**711709**	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
WWTP	**PW368**	**20 Jul 2020**	**0089_PW368_200720**	**Normal**	**EP2007544**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**22 Sep 2020**	**0089_PW368_200922**	**Normal**	**EP2010143**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**15 Dec 2020**	**0089_PW368_201215**	**Normal**	**EP2014048**	<0.02	<0.02	0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**15 Mar 2021**	**0089_PW368_210315**	**Normal**	**EP2102758**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**15 Mar 2021**	**0089_QC102_210315**	**Field Duplicate**	**EP2102758**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**15 Mar 2021**	**0089_QC202_210315**	**Interlab Duplicate**	**781350**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**PW368**	**10 Jun 2021**	**0089_PW368_210610**	**Normal**	**EP2106582**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**01 Sep 2021**	**0089_PW368_210901**	**Normal**	**EP2110155**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**11 Jan 2022**	**0089_PW368_220111**	**Normal**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**18 Mar 2022**	**0089_PW368_220318**	**Normal**	**EP2203195**	<0.02	<0.02	<0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**08 Jun 2022**	**0089_PW368_220608**	**Normal**	**EP2206973**	<0.02	<0.02	0.06	<0.02	0.27	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**05 Sep 2022**	**0089_PW368_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**05 Sep 2022**	**0089_QC118_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**05 Sep 2022**	**0089_QC218_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**PW368**	**12 Dec 2022**	**0089_PW368_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.26	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**12 Dec 2022**	**0089_QC116_221212**	**Field Duplicate**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.22	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**12 Dec 2022**	**0089_QC216_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	0.01	<0.01	0.27	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**PW368**	**13 Mar 2023**	**0089_PW368_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**07 Jun 2023**	**0089_PW368_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	0.15	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW368**	**05 Sep 2023**	**0089_PW368_230905**	**Normal**	**EP2312178**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**17 Apr 2018**	**0089_PW369_180417**	**Normal**	**209522**	<0.001	<0.001	0.019	0.002	0.018	<0.002	0.01	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
WWTP	**PW369**	**09 Jan 2020**	**0089_PW369_200109**	**Normal**	**EP2000249**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**31 Mar 2020**	**0089_PW369_200331**	**Normal**	**EP2003374**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**15 Jul 2020**	**0089_PW369_200715**	**Normal**	**EP2007383**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**24 Sep 2020**	**0089_PW369_200924**	**Normal**	**EP2010271**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**15 Dec 2020**	**0089_PW369_201215**	**Normal**	**EP2014053**	<0.02	<0.02	0.09	<0.02	0.60	<0.02	<0.1	<0.02	0.05	0.02	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**16 Mar 2021**	**0089_PW369_210316**	**Normal**	**EP2102834**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**09 Jun 2021**	**0089_PW369_210609**	**Normal**	**EP2106517**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**01 Sep 2021**	**0089_PW369_210901**	**Normal**	**EP2110154**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**01 Sep 2021**	**0089_QC118_210901**	**Field Duplicate**	**EP2110154**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**01 Sep 2021**	**0089_QC218_210901**	**Interlab Duplicate**	**822579**	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**PW369**	**10 Jan 2022**	**0089_PW369_220110**	**Normal**	**EP2200215**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**14 Mar 2022**	**0089_PW369_220314**	**Normal**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**07 Jun 2022**	**0089_PW369_220607**	**Normal**	**EP2206884**	<0.02	<0.02	0.03	<0.02	0.17	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**05 Sep 2022**	**0089_PW369_220905**	**Normal**	**EP2211341**	<0.02	<0.02	<0.01	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**13 Dec 2022**	**0089_PW369_221213**	**Normal**	**EP2216930**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**14 Mar 2023**	**0089_PW369_230314**	**Normal**	**EP2303175**	<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**07 Jun 2023**	**0089_PW369_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
WWTP	**PW369**	**05 Sep 2023**	**0089_PW369_230905**	**Normal**	**EP2312172**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
Dredge spoil and Careening Bay	**PW374**	**18 Apr 2018**	**0089_PW374_180418**	**Normal**	**209573**	0.006	0.005	0.021	<0.001	0.007	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005
	PW374	**08 Jan 2020**	**0089_PW374_200108**	**Normal**	**EP2000186**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
	PW374	**08 Jan 2020**	**0089_QC108_200108**	**Field Duplicate**	**EP2000186**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
	PW374	**08 Jan 2020**	**0089_QC208_200108**	**Interlab Duplicate**	**696100**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05
	PW374	**30 Mar 2020**	**0089_PW374_200330**	**Normal**	**EP2003313**	<0.02	<0.02	<0.02	<0.02	0.44	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
	PW374	**21 Jul 2020**	**0089_PW374_200721**	**Normal**	**EP2007611**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
	PW374	**21 Sep 2020**	**0089_PW374_200921**	**Normal**	**EP2010085**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
	PW374	**21 Sep 2020**	**0089_QC103_200921**	**Field Duplicate**	**EP2010085**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
	PW374	**21 Sep 2020**	**0089_QC203_200921**	**Interlab Duplicate**	**746269**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05
	PW374	**14 Dec 2020**	**0089_PW374_201214**	**Normal**	**EP2013989**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
	PW374	**15 Mar 2021**	**0089_PW374_210315**	**Normal**	**EP2102758**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
	PW374	**15 Mar 2021**	**0089_QC106_210315**	**Field Duplicate**	**EP2102758**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
	PW374	**15 Mar 2021**	**0089_QC206_210315**	**Interlab Duplicate**	**781350**	<0.01	<0.01	0.07	<0.01	0.04	<0.01	<0.05	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05
	PW374	**10 Jun 2021**	**0089_PW374_210610**	**Normal**	**EP2106582**	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05

Table 2 - Porewater Analytical Results

					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids												PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sul								
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-ethyl perfluorooctane sulfonamidoethanol (MeFOSE)				
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L				
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005				
PFAS NEMP 2020 Drinking Water															*0.56*																				
PFAS NEMP 2020 Freshwater 99%									0.00023*						19																				
PFAS NEMP 2020 Recreational Water															**10**																				
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																															
WWTP	**PW380**	**21 Jul 2020**	**0089_PW380_200721**	**Normal**	**EP2007594**	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW380**	**23 Sep 2020**	**0089_PW380_200923**	**Normal**	**EP2010217**	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW380**	**16 Dec 2020**	**0089_PW380_201216**	**Normal**	**EP2014090**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW380**	**17 Mar 2021**	**0089_PW380_210317**	**Normal**	**EP2102901**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW380**	**08 Jun 2021**	**0089_PW380_210608**	**Normal**	**EP2106450**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW380**	**30 Aug 2021**	**0089_PW380_210830**	**Normal**	**EP2110017**	<0.02	<0.02	0.06	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW380**	**11 Jan 2022**	**0089_PW380_220111**	**Normal**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW380**	**14 Mar 2022**	**0089_PW380_220314**	**Normal**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW380**	**07 Jun 2022**	**0089_PW380_220607**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW380**	**07 Sep 2022**	**0089_PW380_220907**	**Normal**	**EP2211496**	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW380**	**12 Dec 2022**	**0089_PW380_221212**	**Normal**	**EP2216877**	<0.02	<0.02	0.03	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW380**	**15 Mar 2023**	**0089_PW380_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW380**	**07 Jun 2023**	**0089_PW380_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW380**	**05 Sep 2023**	**0089_PW380_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**19 Apr 2018**	**0089_PW381_180419**	**Normal**	**209623**	0.48	0.28	1.4	0.010	0.006	<0.002	0.11	0.21	0.57	0.012	0.004	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005				
WWTP	**PW381**	**30 Jan 2020**	**0089_PW381_200130**	**Normal**	**EP2001003**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**02 Apr 2020**	**0089_PW381_200402**	**Normal**	**EP2003474**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**21 Jul 2020**	**0089_PW381_200721**	**Normal**	**EP2007594**	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**23 Sep 2020**	**0089_PW381_200923**	**Normal**	**EP2010217**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**16 Dec 2020**	**0089_PW381_201216**	**Normal**	**EP2014104**	<0.02	<0.02	<0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.03	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**17 Mar 2021**	**0089_PW381_210317**	**Normal**	**EP2102901**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**08 Jun 2021**	**0089_PW381_210608**	**Normal**	**EP2106450**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**30 Aug 2021**	**0089_PW381_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**11 Jan 2022**	**0089_PW381_220111**	**Normal**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**14 Mar 2022**	**0089_PW381_220314**	**Normal**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**07 Jun 2022**	**0089_PW381_220607**	**Normal**	**EP2206884**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**07 Sep 2022**	**0089_PW381_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**12 Dec 2022**	**0089_PW381_221212**	**Normal**	**EP2216877**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**15 Mar 2023**	**0089_PW381_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**07 Jun 2023**	**0089_PW381_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW381**	**05 Sep 2023**	**0089_PW381_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**19 Apr 2018**	**0089_PW379_180419**	**Normal**	**209623**	0.88	0.61	3.6	0.079	0.040	<0.002	0.17	0.24	1.6	0.096	0.032	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005				
WWTP	**PW401**	**30 Jan 2020**	**0089_PW401_200130**	**Normal**	**EP2001003**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**02 Apr 2020**	**0089_PW401_200402**	**Normal**	**EP2003474**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**21 Jul 2020**	**0089_PW401_200721**	**Normal**	**EP2007594**	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**23 Sep 2020**	**0089_PW401_200923**	**Normal**	**EP2010220**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**16 Dec 2020**	**0089_PW401_201216**	**Normal**	**EP2014090**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**17 Mar 2021**	**0089_PW401_210317**	**Normal**	**EP2102901**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**08 Jun 2021**	**0089_PW401_210608**	**Normal**	**EP2106450**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**30 Aug 2021**	**0089_PW401_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**11 Jan 2022**	**0089_PW401_220111**	**Normal**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**14 Mar 2022**	**0089_PW401_220314**	**Normal**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**07 Jun 2022**	**0089_PW401_220607**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**07 Sep 2022**	**0089_PW401_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**12 Dec 2022**	**0089_PW401_221212**	**Normal**	**EP2216877**	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**15 Mar 2023**	**0089_PW401_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**07 Jun 2023**	**0089_PW401_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
WWTP	**PW401**	**05 Sep 2023**	**0089_PW401_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**14 Jan 2020**	**0089_PW405_200114**	**Normal**	**EP2000432**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**01 Apr 2020**	**0089_PW405_200401**	**Normal**	**EP2003417**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**22 Jul 2020**	**0089_PW405_200722**	**Normal**	**EP2007648**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**21 Sep 2020**	**0089_PW405_200921**	**Normal**	**EP2010085**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**21 Sep 2020**	**0089_QC110_200921**	**Field Duplicate**	**EP2010085**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**21 Sep 2020**	**0089_QC210_200921**	**Interlab Duplicate**	**746269**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05							
HSF	**PW405**	**15 Dec 2020**	**0089_PW405_201215**	**Normal**	**EP2014048**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**15 Mar 2021**	**0089_PW405_210315**	**Normal**	**EP2102752**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**10 Jun 2021**	**0089_PW405_210610**	**Normal**	**EP2106590**	<0.02	0.03	<0.02	<0.02	<0.01	<0.02	<0.1	0.05	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**10 Jun 2021**	**0089_QC115_210610**	**Field Duplicate**	**EP2106590**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	0.05	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**10 Jun 2021**	**0089_QC215_210610**	**Interlab Duplicate**	**802734**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	0.05	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05							
HSF	**PW405**	**31 Aug 2021**	**0089_PW405_210831**	**Normal**	**EP2110065**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**31 Aug 2021**	**0089_QC117_210831**	**Field Duplicate**	**EP2110065**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**31 Aug 2021**	**0089_QC217_210831**	**Interlab Duplicate**	**821197**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05							
HSF	**PW405**	**14 Jan 2022**	**0089_PW405_220114**	**Normal**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**16 Mar 2022**	**0089_PW405_220316**	**Normal**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	0.03	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**07 Jun 2022**	**0089_PW405_220607**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**07 Sep 2022**	**0089_PW405_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**13 Dec 2022**	**0089_PW405_221213**	**Normal**	**EP2216930**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**14 Mar 2023**	**0089_PW405_230314**	**Normal**	**EP2303179**	<0.02	0.08	0.01	<0.02	<0.01	<0.02	<0.1	0.16	0.50	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**08 Jun 2023**	**0089_PW405_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	0.04	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW405**	**05 Sep 2023**	**0089_PW405_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05				
HSF	**PW407**	**14 Jan 2020**	**0089_PW407_200114**	**Normal**	**EP2000432**	<0.02

Table 2 - Porewater Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids												PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sul			
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																*0.56*															
PFAS NEMP 2020 Freshwater 99%										0.00023*						19															
PFAS NEMP 2020 Recreational Water																**10**															
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																										
HSF	**PW413**	**21 Jul 2020**	**0089_PW413_200721**	**Normal**	**EP2007611**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW413**	**22 Sep 2020**	**0089_PW413_200922**	**Normal**	**EP2010143**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW413**	**15 Dec 2020**	**0089_PW413_201215**	**Normal**	**EP2014044**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW413**	**18 Mar 2021**	**0089_PW413_210318**	**Normal**	**EP2102941**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW413**	**09 Jun 2021**	**0089_PW413_210609**	**Normal**	**EP2106519**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW413**	**01 Sep 2021**	**0089_PW413_210901**	**Normal**	**EP2110155**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW413**	**14 Jan 2022**	**0089_PW413_220114**	**Normal**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW413**	**16 Mar 2022**	**0089_PW413_220316**	**Normal**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW413**	**07 Jun 2022**	**0089_PW413_220607**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW413**	**06 Sep 2022**	**0089_PW413_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW413**	**14 Dec 2022**	**0089_PW413_221214**	**Normal**	**EP2216973**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW413**	**15 Mar 2023**	**0089_PW413_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW413**	**08 Jun 2023**	**0089_PW413_230608**	**Normal**	**EP2307593**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW413**	**04 Sep 2023**	**0089_PW413_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**14 Jan 2020**	**0089_PW415_200114**	**Normal**	**EP2000432**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**01 Apr 2020**	**0089_PW415_200401**	**Normal**	**EP2003417**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**21 Jul 2020**	**0089_PW415_200721**	**Normal**	**EP2007611**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**22 Sep 2020**	**0089_PW415_200922**	**Normal**	**EP2010145**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**15 Dec 2020**	**0089_PW415_201215**	**Normal**	**EP2014044**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**18 Mar 2021**	**0089_PW415_210318**	**Normal**	**EP2102941**	<0.02	<0.02	<0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**09 Jun 2021**	**0089_PW415_210609**	**Normal**	**EP2106519**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**01 Sep 2021**	**0089_PW415_210901**	**Normal**	**EP2110155**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**14 Jan 2022**	**0089_PW415_220114**	**Normal**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**16 Mar 2022**	**0089_PW415_220316**	**Normal**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**07 Jun 2022**	**0089_PW415_220607**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**06 Sep 2022**	**0089_PW415_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**14 Dec 2022**	**0089_PW415_221214**	**Normal**	**EP2216973**	<0.02	<0.02	**0.01**	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**15 Mar 2023**	**0089_PW415_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**08 Jun 2023**	**0089_PW415_230608**	**Normal**	**EP2307593**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
HSF	**PW415**	**04 Sep 2023**	**0089_PW415_230904**	**Normal**	**EP2312225**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Freshwater 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:
First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

Table 2 - Porewater Analytical Results

						fonamides			PFAS			Inorganics									Metals								
						N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.004	0.002	0.005	0.001	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water									*0.07*																			
PFAS NEMP 2020 Freshwater 99%																												
PFAS NEMP 2020 Recreational Water									**2**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																							
WWTP	**PW304**	**17 Apr 2018**	**0089_PW304_180417**	**Normal**	**209522**	<0.01	<0.002	<0.05																				
WWTP	**PW304**	**08 Jan 2020**	**0089_PW304_200108**	**Normal**	**EP2000186**	<0.05	<0.02	<0.05	*0.09*	0.09	0.09	<1	302	<1	302	371	397	11,700	3.37	1,670		289		874		382		6,910
WWTP	**PW304**	**01 Apr 2020**	**0089_PW304_200401**	**Normal**	**EP2003438**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	434	<1	434	113	120	3,270	2.68	603		106		273		109		2,050
WWTP	**PW304**	**01 Apr 2020**	**0089_QC101_200401**	**Field Duplicate**	**EP2003438**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	431	<1	431	112	124	3,210	5.28	595		111		284		112		2,120
WWTP	**PW304**	**01 Apr 2020**	**0089_QC201_200401**	**Interlab Duplicate**	**711709**	<0.05	<0.05	<0.05	0.01	<0.05	<0.3	<20	470	<20	470			3,400			110		250		86		2,000	
WWTP	**PW304**	**20 Jul 2020**	**0089_PW304_200720**	**Normal**	**EP2007544**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	443	<1	443	234	255	7,370	4.33	819		314		587		205		4,270
WWTP	**PW304**	**22 Sep 2020**	**0089_PW304_200922**	**Normal**	**EP2010143**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	347	<1	347	412	388	13,100	2.96	1,720		351		858		368		6,690
WWTP	**PW304**	**15 Dec 2020**	**0089_PW304_201215**	**Normal**	**EP2014048**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	209	<1	209	453	469	14,400	1.72	2,060		391		1,090		451		8,010
WWTP	**PW304**	**15 Mar 2021**	**0089_PW304_210315**	**Normal**	**EP2102755**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	352	<1	352	510	544	16,200	3.26	2,190		424		1,220		496		9,420
WWTP	**PW304**	**10 Jun 2021**	**0089_PW304_210610**	**Normal**	**EP2106582**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	657	<1	657	344	321	10,700	3.34	1,380		268		916		357		5,140
WWTP	**PW304**	**01 Sep 2021**	**0089_PW304_210901**	**Normal**	**EP2110155**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	193	<1	193	524	567	16,900	3.87	2,110		437		1,270		521		9,820
WWTP	**PW304**	**11 Jan 2022**	**0089_PW304_220111**	**Normal**	**EP2200240**	<0.05	<0.02	<0.05	*0.09*	0.09	0.09	<1	244	<1	244	626	648	20,000	1.73	2,720		432		1,420		527		11,400
WWTP	**PW304**	**18 Mar 2022**	**0089_PW304_220318**	**Normal**	**EP2203195**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	245	<1	245	406	438	12,900	3.80	1,770		339		1,000		463		7,510
WWTP	**PW304**	**08 Jun 2022**	**0089_PW304_220608**	**Normal**	**EP2206973**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	285	<1	285	548	570	17,300	1.99	2,610		452		1,360		542		9,700
WWTP	**PW304**	**05 Sep 2022**	**0089_PW304_220905**	**Normal**	**EP2211344**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	294	<1	294	497	511	15,900	1.36	2,060		414		1,160		488		8,790
WWTP	**PW304**	**12 Dec 2022**	**0089_PW304_221212**	**Normal**	**EP2216879**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	456	<1	456	179	182	5,530	0.89	670		204		444		130		3,040
WWTP	**PW304**	**13 Mar 2023**	**0089_PW304_230313**	**Normal**	**EP2303086**	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	150	<1	150	657	710	21,000	3.83	2,970		493		1,530		598		12,500
WWTP	**PW304**	**13 Mar 2023**	**0089_QC115_230313**	**Field Duplicate**	**EP2303086**	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	151	<1	151	672	704	21,500	2.35	2,990		489		1,520		595		12,400
WWTP	**PW304**	**13 Mar 2023**	**0089_QC215_230313**	**Interlab Duplicate**	**972487**	<0.05	<0.05	<0.05	*0.08*	0.08																		
WWTP	**PW304**	**07 Jun 2023**	**0089_PW304_230607**	**Normal**	**EP2307502**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	181	<1	181	492	505	15,700	1.25	2,200		429		1,050		315		8,940
WWTP	**PW304**	**05 Sep 2023**	**0089_PW304_230905**	**Normal**	**EP2312178**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	254	<1	254	598	646	19,200	3.88	2,470		465		1,440		513		11,300
HSF	**PW306**	**18 Apr 2018**	**0089_PW306_180418**	**Normal**	**209573**	<0.01	<0.002	<0.05																				
HSF	**PW306**	**10 Jan 2020**	**0089_PW306_200110**	**Normal**	**EP2000293**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	589	598	18,800	0.74	2,720		416		1,310		508		10,500
HSF	**PW306**	**31 Mar 2020**	**0089_PW306_200331**	**Normal**	**EP2003366**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	162	<1	162	596	756	18,900	11.9	2,850		532		1,750		796		13,000
HSF	**PW306**	**22 Jul 2020**	**0089_PW306_200722**	**Normal**	**EP2007648**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	136	<1	136	587	644	18,700	4.60	2,740		434		1,380		501		11,400
HSF	**PW306**	**23 Sep 2020**	**0089_PW306_200923**	**Normal**	**EP2010220**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	120	<1	120	618	678	19,700	4.60	2,880		489		1,550		656		11,700
HSF	**PW306**	**15 Dec 2020**	**0089_PW306_201215**	**Normal**	**EP2014048**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	184	<1	184	631	677	20,100	3.51	2,910		517		1,520		677		11,700
HSF	**PW306**	**17 Mar 2021**	**0089_PW306_210317**	**Normal**	**EP2102892**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	201	<1	201	649	609	20,600	3.13	3,050		465		1,340		576		10,600
HSF	**PW306**	**09 Jun 2021**	**0089_PW306_210609**	**Normal**	**EP2106519**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	115	<1	115	583	673	18,700	7.17	2,550		472		1,510		634		11,700
HSF	**PW306**	**31 Aug 2021**	**0089_PW306_210831**	**Normal**	**EP2110072**	<0.05	<0.03	<0.05	<0.01	<0.01	<0.01	<1	119	<1	119	554	627	17,700	6.20	2,510		452		1,410		563		10,900
HSF	**PW306**	**13 Jan 2022**	**0089_PW306_220113**	**Normal**	**EP2200338**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	137	<1	137	612	717	19,700	7.96	2,550		470		1,580		614		12,600
HSF	**PW306**	**16 Mar 2022**	**0089_PW306_220316**	**Normal**	**EP2203058**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	116	<1	116	605	664	19,300	4.69	2,800		456		1,520		644		11,500
HSF	**PW306**	**07 Jun 2022**	**0089_PW306_220607**	**Normal**	**EP2206887**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	629	<1	629	616	602	19,300	1.09	2,810		541		1,410		607		10,200
HSF	**PW306**	**06 Sep 2022**	**0089_PW306_220906**	**Normal**	**EP2211401**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	117	<1	117	571	618	18,200	4.02	2,640		434		1,390		494		10,800
HSF	**PW306**	**13 Dec 2022**	**0089_PW306_221213**	**Normal**	**EP2217375**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	134	<1	134	695	659	22,300	2.64	3,020		455		1,420		574		11,600
HSF	**PW306**	**14 Mar 2023**	**0089_PW306_230314**	**Normal**	**EP2303175**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	158	<1	158	618	678	19,700	4.63	2,820		472		1,480		570		11,900
HSF	**PW306**	**08 Jun 2023**	**0089_PW306_230608**	**Normal**	**EP2307590**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	135	<1	135	566	602	18,200	3.15	2,380		487		1,250		385		10,700
HSF	**PW306**	**04 Sep 2023**	**0089_PW306_230904**	**Normal**	**EP2312225**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	120	<1	120	604	618	19,400	1.12	2,620		432		1,430		515		10,700
HSF	**PW307**	**30 Apr 2018**	**0089_PW307_180430**	**Normal**	**209959**	<0.01	<0.002	<0.05																				
HSF	**PW307**	**10 Jan 2020**	**0089_PW307_200110**	**Normal**	**EP2000293**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	113	<1	113	584	606	18,600	1.91	2,730		427		1,350		509		10,600
HSF	**PW307**	**31 Mar 2020**	**0089_PW307_200331**	**Normal**	**EP2003366**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	576	692	18,300	9.14	2,780		497		1,600		722		11,900
HSF	**PW307**	**22 Jul 2020**	**0089_PW307_200722**	**Normal**	**EP2007648**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	587	649	18,700	5.02	2,740		433		1,390		501		11,500
HSF	**PW307**	**23 Sep 2020**	**0089_PW307_200923**	**Normal**	**EP2010220**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	632	694	20,200	4.64	2,880		490		1,580		676		12,000
HSF	**PW307**	**15 Dec 2020**	**0089_PW307_201215**	**Normal**	**EP2014053**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	627	722	19,900	7.07	3,030		525		1,630		710		12,500
HSF	**PW307**	**17 Mar 2021**	**0089_PW307_210317**	**Normal**	**EP2102892**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	118	<1	118	646	595	20,600	4.17	3,030		424		1,300		557		10,400
HSF	**PW307**	**09 Jun 2021**	**0089_PW307_210609**	**Normal**	**EP2106519**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	114	<1	114	578	689	18,500	8.80	2,580		482		1,540		651		12,000
HSF	**PW307**	**31 Aug 2021**	**0089_PW307_210831**	**Normal**	**EP2110065**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	117	<1	117	552	590	17,700	3.36	2,420		406		1,320		526		10,300
HSF	**PW307**	**13 Jan 2022**	**0089_PW307_220113**	**Normal**	**EP2200338**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	110	<1	110	616	685	19,900	5.24	2,540		447		1,520		596		12,000
HSF	**PW307**	**16 Mar 2022**	**0089_PW307_220316**	**Normal**	**EP2203058**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	132	<1	132	590	676	18,800	6.80	2,740		475		1,540		654		11,700
HSF	**PW307**	**07 Jun 2022**	**0089_PW307_220607**	**Normal**	**EP2206887**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	137	<1	137	538	610	17,100	6.26	2,540		442		1,420		555		10,500
HSF	**PW307**	**06 Sep 2022**	**0089_PW307_220906**	**Normal**	**EP2211401**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	559	630	17,800	5.99	2,610		437		1,420		506		11,000
HSF	**PW307**	**13 Dec 2022**	**0089_PW307_221213**	**Normal**	**EP2217375**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	705	678	22,600	1.97	3,130		468		1,480		595		11,900
HSF	**PW307**	**14 Mar 2023**	**0089_PW307_230314**	**Normal**	**EP2303175**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	624	684	20,000	4.51	2,780		469		1,500		574		12,000
HSF	**PW307**	**08 Jun 2023**	**0089_PW307_230608**	**Normal**	**EP2307590**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	134	<1	134	568	586	18,400	1.57	2,220		471		1,220		383		10,400
HSF	**PW307**	**04 Sep 2023**	**0089_PW307_230904**	**Normal**	**EP2312228**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	582	663	18,600	6.52	2,640		450		1,480		566		11,600
HSF	**PW308**	**30 Apr 2018**	**0089_PW308_180430**	**Normal**	**209959**	<0.01	<0.002	<0.05																				
HSF	**PW308**	**10 Jan 2020**	**0089_PW308_200110**	**Normal**	**EP2000293**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	118	<1	118	587	593	18,700	0.51	2,730		413		1,300		500		10,400
HSF	**PW308**	**01 Apr 2020**	**0089_PW308_200401**	**Normal**	**EP2003417**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	640	731	20,500	6.60	2,870		507		1,680		758		12,600
HSF	**PW308**	**22 Jul 2020**	**0089_PW308_200722**	**Normal**	**EP2007648**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	146	<1	146	590	645	18,800	4.42	2,750		439		1,390		505		11,400
HSF	**PW308**	**23 Sep 2020**	**0089_PW308_200923**	**Normal**	**EP2010217**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	607	694	19,300	6.68	2,880		492		1,580		674		12,000
HSF	**PW308**	**15 Dec 2020**	**0089_PW308_201215**	**Normal**	**EP2014053**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	117	<1	117	614	703	19,400	6.83	3,070		507		1,580		684		12,200
HSF	**PW308**	**17 Mar 2021**	**0089_PW308_210317**	**Normal**	**EP2102892**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	156	<1	156	642	590	20,400	4.19	3,040		420		1,300		556		10,300
HSF	**PW308**	**09 Jun 2021**	**0089_PW308_210609**	**Normal**	**EP2106519**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	111	<1	111	576	662	18,400	6.98	2,620		468		1,490		625		11,500
HSF	**PW308**	**31 Aug 2021**	**0089_PW308_210831**	**Normal**	**EP2110072**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	127	<1	127	563	685	18,000	9.77	2,520		486		1,540		625		11,900
HSF	**PW308**	**13 Jan 2022**	**0089_PW308_220113**	**Normal**	**EP2200338**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	113	<1	113	616	678	19,900	4.81	2,510		443		1,500		582		11,900
HSF	**PW308**	**16 Mar 2022**	**0089_PW308_220316**	**Normal**	**EP2203058**	<0.05	<0.02	<0.05	<0.03	<0.01	<0.01	<1	136	<1	136	600	651	19,100	4.09	2,820		447		1,480		619		11,300
HSF	**PW308**	**07 Jun 2022**	**0089_PW308_220607**	**Normal**	**EP2206887**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	132	<1	132	520	606	16,400	7.69	2,610		439		1,430		557		10,400
HSF	**PW308**	**06 Sep 2022**	**0089_PW308_220906**	**Normal**	**EP2211401**	<0.05	<0.03	<0.05	<0.01	<0.01	<0.01	<1	114	<1	114	593	601	19,000	0.67	2,620		417		1,350		477		10,500
HSF	**PW308**	**13 Dec 2022**	**0089_PW308_221213**	**Normal**	**EP2217375**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	697	648	22,400	3.62	3,020		446		1,410		563		11,400
HSF	**PW308**	**14 Mar 2023**	**0089_PW308_230314**	**Normal**	**EP2303175**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	136	<1	136	620	683	19,900	4.78	2,710		470		1,490		575		12,000
HSF	**PW308**	**08 Jun 2023**	**0089_PW308_230608**	**Normal**	**EP2307590**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	135	<1	135	567	597	18,300	2.56	2,310		478		1,240		383		10,600
HSF	**PW308**	**04 Sep 2023**	**0089_PW308_230904**	**Normal**	**EP2312228**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	591	663	18,800	5.75	2,800		453		1,480		563		11,600
HSF	**PW314**	**18 Apr 2018**	**0089_PW314_180418**	**Normal**	**209573**	<0.01	<0.002	<0.05																				
HSF	**PW314**	**10 Jan 2020**	**0089_PW314_200110**	**Normal**	**EP2000293**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	586	582	18,700	0.30	2,680		412		1,280		496		10,200
HSF	**PW314**	**31 Mar 2020**	**0089_PW314_200331**	**Normal**	**EP2003366**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	165	<1	165	591	710	18,800	9.16	2,760		531		1,630		740		12,200
HSF	**PW314**	**22 Jul 2020**	**0089_PW314_200722**	**Normal**	**EP2007648**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	134	<1	134	586	667	18,700	6.45	2,680		454		1,430		515		11,800
HSF	**PW314**	**23 Sep 2020**	**0089_PW314_200923**	**Normal**	**EP2010220**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	179	<1	179	631	682	20,100	3.88	2,910		486		1,550		663		11,800
HSF	**PW314**	**15 Dec 2020**	**0089_PW314_201215**	**Normal**	**EP2014048**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	341	<1	341	638	721	20,300	6.14	2,800		578		1,630		737		12,400
HSF	**PW314**	**17 Mar 2021**	**0089_PW314_210317**	**Normal**	**EP2102892**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	131	<1	131	657	607	20,900	3.96	3,110		433		1,330		577		10,600
HSF	**PW314**	**09 Jun 2021**	**0089_PW314_210609**	**Normal**	**EP2106519**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	109	<1	109	583	657	18,700	5.90	2,580		463		1,480		619		11,400
HSF	**PW314**	**31 Aug 2021**	**0089_PW314_210831**	**Normal**	**EP2110065**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	117	<1	117	561	586	18,000	2.14	2,450		402		1,320		521		10,200
HSF	**PW314**	**13 Jan 2022**	**0089_PW314_220113**	**Normal**	**EP2200338**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	116	<1	116	623	674	20,100	3.92	2,580		444		1,500		585		11,800
HSF	**PW314**	**16 Mar 2022**	**0089_PW314_220316**	**Normal**	**EP2203058**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	135	<1	135	604	700	19,300	7.37	2,710		489		1,600		674		12,100
HSF	**PW314**	**07 Jun 2022**	**0089_PW314_220607**	**Normal**	**EP2206887**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	158	<1	158	599	594	19,000	0.40	2,890		452		1,380		576		10,200
HSF	**PW314**	**06 Sep 2022**	**0089_PW314_220906**	**Normal**	**EP2211401**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	118	<1	118	587	606	18,800	1.64	2,600		421		1,360		485		10,600
HSF	**PW314**	**13 Dec 2022**	**0089_PW314_221213**	**Normal**	**EP2217375**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	685	662	22,000	1.76	3,000		459		1,450		585		11,600
HSF	**PW314**	**14 Mar 2023**	**0089_PW314_230314**	**Normal**	**EP2303175**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	146	<1	146	624	673	19,900	3.78	2,870		482		1,470		579		11,800
HSF	**PW314**	**08 Jun 2023**	**0089_PW314_230608**	**Normal**	**EP2307590**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	567	632	18,200	5.36	2,460		491		1,330		406		11,200
HSF	**PW314**	**04 Sep 2023**	**0089_PW314_230904**	**Normal**	**EP2312225**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	608	629	19,500	1.71	2,650		440		1,450		524		10,900
HSF	**PW315**	**30 Apr 2018**	**0089_PW315_180430**	**Normal**	**209959**	<0.01	<0.002	<0.05																				
HSF	**PW315**	**10 Jan 2020**	**0089_PW315_200110**	**Normal**	**EP2000293**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	114	<1	114	608	611	19,300	0.24	2,940		424		1,350		513		10,700
HSF	**PW315**	**01 Apr 2020**	**0089_PW315_200401**	**Normal**	**EP2003417**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	642	753	20,600	7.94	2,810		523		1,720		775		13,000
HSF	**PW315**	**22 Jul 2020**	**0089_PW315_200722**	**Normal**	**EP2007648**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	160	<1	160	584	646	18,600	5.08	2,690		452		1,390		530		11,400
HSF	**PW315**	**23 Sep 2020**	**0089_PW315_200923**	**Normal**	**EP2010217**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	616	705	19,600	6.73	2,920		502		1,600		688		12,200
HSF	**PW315**	**15 Dec 2020**	**0089_PW315_201215**	**Normal**	**EP2014048**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	644	706	20,600	4.55	2,910		516		1,590		718		12,200
HSF	**PW315**	**17 Mar 2021**	**0089_PW315_210317**	**Normal**	**EP2102892**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	633	578	20,200	4.55	2,940		412		1,270		542		10,100
HSF	**PW315**	**09 Jun 2021**	**0089_PW315_210609**	**Normal**	**EP2106519**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	114	<1	114	577	652	18,500	6.08	2,560		463		1,480		616		11,300
HSF	**PW315**	**31 Aug 2021**	**0089_PW315_210831**	**Normal**	**EP2110072**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	120	<1	120	552	662	17,700	8.99	2,440		471		1,490		600		11,500
HSF	**PW315**	**31 Aug 2021**	**0089_QC116_210831**	**Field Duplicate**	**EP2110072**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	120	<1	120	558	680	17,900	9.87	2,440		490		1,540		622		11,800
HSF	**PW315**	**31 Aug 2021**	**0089_QC216_210831**	**Interlab Duplicate**	**821197**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.3																	
HSF	**PW315**	**12 Jan 2022**	**0089_QC219_220113**	**Interlab Duplicate**	**855202**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.3																	
HSF	**PW315**	**13 Jan 2022**	**0089_PW315_220113**	**Normal**	**EP2200338**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01

Table 2 - Porewater Analytical Results

						Ionamides			PFAS			Inorganics									Metals							
						N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) (as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.004	0.002	0.005	0.001	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water									*0.07*																			
PFAS NEMP 2020 Freshwater 99%																												
PFAS NEMP 2020 Recreational Water									**2**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																							
HSF	**PW316**	**06 Sep 2022**	**0089_PW316_220906**	**Normal**	**EP2211401**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	119	<1	119	587	618	18,800	2.51	2,620		431		1,380		496		10,800
HSF	**PW316**	**13 Dec 2022**	**0089_PW316_221213**	**Normal**	**EP2217375**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	697	644	22,400	3.94	3,010		445		1,410		567		11,300
HSF	**PW316**	**14 Mar 2023**	**0089_PW316_230314**	**Normal**	**EP2303175**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	636	682	20,400	3.54	2,780		465		1,490		572		12,000
HSF	**PW316**	**08 Jun 2023**	**0089_PW316_230608**	**Normal**	**EP2307590**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	131	<1	131	582	588	18,500	0.45	2,790		472		1,240		384		10,400
HSF	**PW316**	**04 Sep 2023**	**0089_PW316_230904**	**Normal**	**EP2312228**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	596	654	19,100	4.64	2,610		450		1,470		559		11,400
Demolition Ground	**PW329**	**12 Apr 2018**	**0089_PW329_180412**	**Normal**	**209345**	<0.01	<0.002	<0.05																				
Demolition Ground	**PW329**	**10 Jan 2020**	**0089_PW329_200110**	**Normal**	**EP2000252**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	223	<1	223	837	931	27,000	5.35	3,400		664		2,100		985		16,100
Demolition Ground	**PW329**	**30 Mar 2020**	**0089_PW329_200330**	**Normal**	**EP2003308**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	462	<1	462	661	802	20,800	9.68	3,120		725		1,870		817		13,600
Demolition Ground	**PW329**	**20 Jul 2020**	**0089_PW329_200720**	**Normal**	**EP2007544**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	565	690	18,000	9.94	2,640		477		1,510		607		12,100
Demolition Ground	**PW329**	**23 Sep 2020**	**0089_PW329_200923**	**Normal**	**EP2010217**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	200	<1	200	626	676	19,900	3.85	2,910		484		1,530		666		11,700
Demolition Ground	**PW329**	**14 Dec 2020**	**0089_PW329_201214**	**Normal**	**EP2013973**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	134	<1	134	610	689	19,400	6.10	2,870		472		1,550		616		12,000
Demolition Ground	**PW329**	**14 Dec 2020**	**0089_QC102_201214**	**Field Duplicate**	**EP2013973**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	603	676	19,200	5.68	2,840		461		1,510		608		11,800
Demolition Ground	**PW329**	**14 Dec 2020**	**0089_QC202_201114**	**Interlab Duplicate**	**765054**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	170	<20	170			26,000			520		1,600		500		12,000	
Demolition Ground	**PW329**	**16 Mar 2021**	**0089_PW329_210316**	**Normal**	**EP2102836**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	186	<1	186	658	725	21,000	4.79	3,000		517		1,620		689		12,600
Demolition Ground	**PW329**	**16 Mar 2021**	**0089_QC110_210316**	**Field Duplicate**	**EP2102836**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	148	<1	148	661	707	21,100	3.34	3,020		511		1,570		666		12,300
Demolition Ground	**PW329**	**16 Mar 2021**	**0089_QC210_210316**	**Interlab Duplicate**	**781350**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	190					19,000			530		1,400		420		11,000	
Demolition Ground	**PW329**	**08 Jun 2021**	**0089_PW329_210608**	**Normal**	**EP2106465**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	146	<1	146	546	634	17,300	7.45	2,640		466		1,420		595		11,000
Demolition Ground	**PW329**	**08 Jun 2021**	**0089_QC103_210608**	**Field Duplicate**	**EP2106465**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	140	<1	140	553	635	17,500	6.93	2,700		473		1,430		593		11,000
Demolition Ground	**PW329**	**08 Jun 2021**	**0089_QC203_210608**	**Interlab Duplicate**	**802464**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	290					20,000			580		1,500		500		12,000	
Demolition Ground	**PW329**	**30 Aug 2021**	**0089_PW329_210830**	**Normal**	**EP2110017**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	147	<1	147	556	601	17,800	3.89	2,460		450		1,350		600		10,400
Demolition Ground	**PW329**	**10 Jan 2022**	**0089_PW329_220110**	**Normal**	**EP2200218**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	178	<1	178	708	719	22,800	0.78	2,940		467		1,530		513		12,800
Demolition Ground	**PW329**	**10 Jan 2022**	**0089_QC108_220110**	**Field Duplicate**	**EP2200218**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
Demolition Ground	**PW329**	**10 Jan 2022**	**0089_QC208_220110**	**Interlab Duplicate**	**854607**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
Demolition Ground	**PW329**	**15 Mar 2022**	**0089_PW329_220315**	**Normal**	**EP2203019**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	151	<1	151	604	692	19,300	6.82	2,720		494		1,570		652		12,000
Demolition Ground	**PW329**	**15 Mar 2022**	**0089_QC116_220315**	**Field Duplicate**	**EP2203019**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
Demolition Ground	**PW329**	**15 Mar 2022**	**0089_QC216_220315**	**Interlab Duplicate**	**872903**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
Demolition Ground	**PW329**	**08 Jun 2022**	**0089_PW329_220608**	**Normal**	**EP2206970**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	245	<1	245	568	651	18,200	6.83	2,370		509		1,540		624		11,100
Demolition Ground	**PW329**	**05 Sep 2022**	**0089_PW329_220905**	**Normal**	**EP2211347**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	175	<1	175	599	630	19,200	2.58	2,570		442		1,420		507		11,000
Demolition Ground	**PW329**	**12 Dec 2022**	**0089_PW329_221212**	**Normal**	**EP2216873**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	180	<1	180	801	679	26,100	8.25	2,930		480		1,480		602		11,900
Demolition Ground	**PW329**	**15 Mar 2023**	**0089_PW329_230315**	**Normal**	**EP2303227**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	615	675	19,600	4.66	2,850		462		1,460		556		11,900
Demolition Ground	**PW329**	**07 Jun 2023**	**0089_PW329_230607**	**Normal**	**EP2307498**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	269	<1	269	543	598	17,400	4.86	2,240		502		1,240		394		10,600
Demolition Ground	**PW329**	**11 Sep 2023**	**0089_PW329_230911**	**Normal**	**EP2312525**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	135	<1	135	577	648	18,500	5.78	2,530		454		1,460		539		11,300
Demolition Ground	**PW330**	**12 Apr 2018**	**0089_PW330_180412**	**Normal**	**209345**	<0.01	<0.002	<0.05																				
Demolition Ground	**PW330**	**10 Jan 2020**	**0089_PW330_200110**	**Normal**	**EP2000252**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	322	<1	322	890	945	28,800	2.98	3,430		696		2,140		979		16,300
Demolition Ground	**PW330**	**30 Mar 2020**	**0089_PW330_200330**	**Normal**	**EP2003308**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	257	<1	257	629	756	19,900	9.17	3,010		623		1,760		747		12,900
Demolition Ground	**PW330**	**20 Jul 2020**	**0089_PW330_200720**	**Normal**	**EP2007544**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	586	672	18,700	6.88	2,690		465		1,470		592		11,800
Demolition Ground	**PW330**	**22 Sep 2020**	**0089_PW330_200922**	**Normal**	**EP2010151**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	160	<1	160	617	687	19,700	5.40	2,790		528		1,540		652		11,900
Demolition Ground	**PW330**	**14 Dec 2020**	**0089_PW330_201214**	**Normal**	**EP2013989**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	626	731	19,900	7.77	2,980		516		1,640		715		12,700
Demolition Ground	**PW330**	**16 Mar 2021**	**0089_PW330_210316**	**Normal**	**EP2102836**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	134	<1	134	661	713	21,200	3.76	2,920		511		1,590		685		12,400
Demolition Ground	**PW330**	**08 Jun 2021**	**0089_PW330_210608**	**Normal**	**EP2106465**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	138	<1	138	570	628	18,200	4.92	2,570		465		1,410		594		10,900
Demolition Ground	**PW330**	**30 Aug 2021**	**0089_PW330_210830**	**Normal**	**EP2110017**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	148	<1	148	553	595	17,600	3.64	2,570		443		1,330		591		10,300
Demolition Ground	**PW330**	**10 Jan 2022**	**0089_PW330_220110**	**Normal**	**EP2200218**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	144	<1	144	680	763	21,900	5.78	2,850		490		1,620		550		13,600
Demolition Ground	**PW330**	**15 Mar 2022**	**0089_PW330_220315**	**Normal**	**EP2203019**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	131	<1	131	618	731	19,800	8.40	2,730		512		1,650		686		12,700
Demolition Ground	**PW330**	**08 Jun 2022**	**0089_PW330_220608**	**Normal**	**EP2206970**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	418	<1	418	586	671	18,600	6.82	2,520		586		1,580		631		11,400
Demolition Ground	**PW330**	**08 Jun 2022**	**0089_QC117_220608**	**Field Duplicate**	**EP2206970**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
Demolition Ground	**PW330**	**08 Jun 2022**	**0089_QC217_220608**	**Interlab Duplicate**	**896805**	<0.004	<0.004	<0.008	<0.002	<0.001	<0.001																	
Demolition Ground	**PW330**	**05 Sep 2022**	**0089_PW330_220905**	**Normal**	**EP2211347**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	154	<1	154	594	642	19,000	3.88	2,640		449		1,450		513		11,200
Demolition Ground	**PW330**	**12 Dec 2022**	**0089_PW330_221212**	**Normal**	**EP2216873**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	192	<1	192	685	650	22,000	2.66	2,910		464		1,410		566		11,400
Demolition Ground	**PW330**	**12 Dec 2022**	**0089_QC105_221212**	**Field Duplicate**	**EP2216873**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
Demolition Ground	**PW330**	**12 Dec 2022**	**0089_QC205_221212**	**Interlab Duplicate**	**950091**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
Demolition Ground	**PW330**	**15 Mar 2023**	**0089_PW330_230315**	**Normal**	**EP2303227**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	134	<1	134	594	679	18,900	6.65	2,820		463		1,460		547		12,000
Demolition Ground	**PW330**	**07 Jun 2023**	**0089_PW330_230607**	**Normal**	**EP2307498**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	168	<1	168	550	593	17,400	3.76	2,670		513		1,220		389		10,500
Demolition Ground	**PW330**	**11 Sep 2023**	**0089_PW330_230911**	**Normal**	**EP2312525**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	146	<1	146	581	654	18,600	5.92	2,560		452		1,480		539		11,400
Demolition Ground	**PW331**	**12 Apr 2018**	**0089_PW331_180412**	**Normal**	**209345**	<0.01	<0.002	<0.05																				
Demolition Ground	**PW331**	**10 Jan 2020**	**0089_PW331_200110**	**Normal**	**EP2000252**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	234	<1	234	673	789	21,400	7.91	3,120		576		1,800		800		13,600
Demolition Ground	**PW331**	**30 Mar 2020**	**0089_PW331_200330**	**Normal**	**EP2003308**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	241	<1	241	656	764	20,900	7.63	2,940		613		1,800		770		13,000
Demolition Ground	**PW331**	**20 Jul 2020**	**0089_PW331_200720**	**Normal**	**EP2007544**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	568	655	18,200	7.11	2,520		454		1,430		582		11,500
Demolition Ground	**PW331**	**23 Sep 2020**	**0089_PW331_200923**	**Normal**	**EP2010220**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	210	<1	210	639	668	20,400	2.15	2,870		489		1,530		664		11,500
Demolition Ground	**PW331**	**14 Dec 2020**	**0089_PW331_201214**	**Normal**	**EP2013973**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	142	<1	142	606	712	19,300	7.99	2,840		509		1,620		703		12,300
Demolition Ground	**PW331**	**14 Dec 2020**	**0089_QC104_201214**	**Field Duplicate**	**EP2013973**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	141	<1	141	606	711	19,300	7.98	2,820		512		1,610		703		12,300
Demolition Ground	**PW331**	**14 Dec 2020**	**0089_QC204_201114**	**Interlab Duplicate**	**765054**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	180	<20	180			49,000			470		1,500		450		11,000	
Demolition Ground	**PW331**	**16 Mar 2021**	**0089_PW331_210316**	**Normal**	**EP2102836**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	172	<1	172	646	736	20,600	6.46	2,970		538		1,630		700		12,800
Demolition Ground	**PW331**	**08 Jun 2021**	**0089_PW331_210608**	**Normal**	**EP2106465**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	110	591	622	18,900	2.59	2,660		446		1,400		584		10,800
Demolition Ground	**PW331**	**30 Aug 2021**	**0089_PW331_210830**	**Normal**	**EP2110017**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	545	605	17,400	5.26	2,470		443		1,350		599		10,500
Demolition Ground	**PW331**	**10 Jan 2022**	**0089_PW331_220110**	**Normal**	**EP2200218**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	135	<1	135	672	720	21,700	3.46	2,750		469		1,540		524		12,800
Demolition Ground	**PW331**	**15 Mar 2022**	**0089_PW331_220315**	**Normal**	**EP2203019**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	172	<1	172	619	687	19,800	5.19	2,750		491		1,560		648		11,900
Demolition Ground	**PW331**	**15 Mar 2022**	**0089_QC114_220315**	**Field Duplicate**	**EP2203019**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	172	<1	172	591	702	18,800	8.59	2,750		494		1,580		656		12,200
Demolition Ground	**PW331**	**15 Mar 2022**	**0089_QC214_220315**	**Interlab Duplicate**	**872903**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
Demolition Ground	**PW331**	**08 Jun 2022**	**0089_PW331_220608**	**Normal**	**EP2206970**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	247	<1	247	564	684	17,600	9.63	3,020		529		1,610		654		11,700
Demolition Ground	**PW331**	**08 Jun 2022**	**0089_QC118_220608**	**Field Duplicate**	**EP2206970**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
Demolition Ground	**PW331**	**08 Jun 2022**	**0089_QC218_220608**	**Interlab Duplicate**	**896805**	<0.004	<0.004	<0.008	0.006	0.006	0.006																	
Demolition Ground	**PW331**	**05 Sep 2022**	**0089_PW331_220905**	**Normal**	**EP2211347**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	203	<1	203	564	631	18,000	5.65	2,490		451		1,410		551		11,000
Demolition Ground	**PW331**	**05 Sep 2022**	**0089_QC106_220905**	**Field Duplicate**	**EP2211347**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	209	<1	209	684	621	22,300	4.86	2,450		441		1,390		573		10,800
Demolition Ground	**PW331**	**05 Sep 2022**	**0089_QC206_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
Demolition Ground	**PW331**	**12 Dec 2022**	**0089_PW331_221212**	**Normal**	**EP2216873**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	214	<1	214	657	676	21,000	1.48	2,880		471		1,460		587		11,900
Demolition Ground	**PW331**	**15 Mar 2023**	**0089_PW331_230315**	**Normal**	**EP2303227**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	152	<1	152	719	687	23,300	2.25	2,810		497		1,530		568		12,000
Demolition Ground	**PW331**	**07 Jun 2023**	**0089_PW331_230607**	**Normal**	**EP2307498**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	268	<1	268	535	598	17,000	5.55	2,410		496		1,240		394		10,600
Demolition Ground	**PW331**	**11 Sep 2023**	**0089_PW331_230911**	**Normal**	**EP2312525**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	148	<1	148	575	654	18,400	6.45	2,540		455		1,480		539		11,400
FTA	**PW335**	**13 Apr 2018**	**0089_PW335_180413**	**Normal**	**209417**	<0.01	<0.002	<0.05																				
FTA	**PW335**	**13 Apr 2018**	**0089_QC1PW_180413**	**Field Duplicate**	**209417**	<0.01	<0.002	<0.05																				
FTA	**PW335**	**13 Apr 2018**	**0089_QC2PW_180413**	**Interlab Duplicate**	**594110**	<0.005	<0.005	<0.005	0.016	0.023	0.023																	
FTA	**PW335**	**13 Apr 2018**	**0089_QC2PW_180413**	**Interlab Duplicate**	**594110**	<0.005	<0.005	<0.005																				
FTA	**PW335**	**09 Jan 2020**	**0089_PW335_200109**	**Normal**	**EP2000249**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	142	<1	142	665	749	21,300	5.96	2,930		492		1,690		604		13,100
FTA	**PW335**	**30 Mar 2020**	**0089_PW335_200330**	**Normal**	**EP2003333**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	271	<1	271	561	664	17,800	8.42	2,560		514		1,580		656		11,300
FTA	**PW335**	**15 Jul 2020**	**0089_PW335_200715**	**Normal**	**EP2007383**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	195	<1	195	575	681	18,300	8.41	2,640		530		1,470		611		11,900
FTA	**PW335**	**15 Jul 2020**	**0089_QC104_200715**	**Field Duplicate**	**EP2007383**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	194	<1	194	560	636	17,800	6.35	2,590		487		1,400		529		11,100
FTA	**PW335**	**15 Jul 2020**	**0089_QC204_200215**	**Interlab Duplicate**	**732844**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	200	<20	200			19,000			520		1,400		430		10,000	
FTA	**PW335**	**22 Sep 2020**	**0089_PW335_200922**	**Normal**	**EP2010151**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	136	<1	136	618	691	19,700	5.59	2,840		495		1,550		645		12,000
FTA	**PW335**	**14 Dec 2020**	**0089_PW335_201214**	**Normal**	**EP2013985**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	192	<1	192	621	704	19,800	6.19	2,840		511		1,580		679		12,200
FTA	**PW335**	**14 Dec 2020**	**0089_QC105_201214**	**Field Duplicate**	**EP2013985**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	192	<1	192	629	734	20,000	7.70	2,940		539		1,660		712		12,700
FTA	**PW335**	**14 Dec 2020**	**0089_QC205_201114**	**Interlab Duplicate**	**765054**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	240	<20	240			20,000			490		1,500		450		11,000	
FTA	**PW335**	**15 Mar 2021**	**0089_PW335_210315**	**Normal**	**EP2102752**	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	145	<1	145	660	727	21,200	4.77	2,860		508		1,600		674		12,700
FTA	**PW335**	**08 Jun 2021**	**0089_PW335_210608**	**Normal**	**EP2106465**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	125	<1	125	581	634	18,600	4.34	2,600		460		1,430		586		11,000
FTA	**PW335**	**30 Aug 2021**	**0089_PW335_210830**	**Normal**	**EP2110021**	<0.05	<0.02	<0.05	0.13	0.13	0.13	<1	114	<1	114	552	562	17,700	0.96	2,400		409		1,260		564		9,740
FTA	**PW335**	**10 Jan 2022**	**0089_PW335_220110**	**Normal**	**EP2200215**	<0.05	<0.02	<0.05	0.02	0.13	0.13	<1	114	<1	114	624	590	20,000	2.77	2,770		417		1,260		532		10,400
FTA	**PW335**	**14 Mar 2022**	**0089_PW335_220314**	**Normal**	**EP2202977**	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	118	<1	118	628	693	20,200	4.90	2,680		486		1,580		645		12,000
FTA	**PW335**	**07 Jun 2022**	**0089_PW335_220607**	**Normal**	**EP2206881**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	164	<1	164	625	567	20,200	4.87	2,490		468		1,310		558		9,690
FTA	**PW335**	**05 Sep 2022**	**0089_PW335_220905**	**Normal**	**EP2211344**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	148	<1	148	571	593	18,200	1.88	2,640		414		1,330		589		10,300
FTA	**PW335**	**12 Dec 2022**	**0089_PW335_221212**	**Normal**	**EP2216879**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	188	<1	188	580	653	18,700	5.98	2,320		446		1,430		513		11,500
FTA	**PW335**	**13 Mar 2023**	**0089_PW335_230313**	**Normal**	**EP2303086**	<0.05	<0.02	<0.05	*0.14*	0.14	0.14	<1	159	<1	159	722	796	23,100	4.88	3,240		542		1,740		672		14,000
FTA	**PW335**	**07 Jun 2023**	**0089_PW335_230607**	**Normal**	**EP2307502**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	168	<1	168	561	571	17,900	0.89	2,520		439		1,170		350		10,200
FTA	**PW335**	**05 Sep 2023**	**0089_PW335_230905**	**Normal**	**EP2312188**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	150	<1	150	575	642	18,400	5.52	2,540		442		1,440		561		11,200
FTA	**PW340**	**13 Apr 2018**	**0089_PW340_180413**	**Normal**	**209417**	<0.01	<0.002	<0.05																				
FTA	**PW340**	**09 Jan 2020**	**0089_PW340_200109**	**Normal**	**EP2000249**

Table 2 - Porewater Analytical Results

						fonamides			PFAS			Inorganics										Metals							
						N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) (as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.004	0.002	0.005	0.001	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water									*0.07*																			
PFAS NEMP 2020 Freshwater 99%																												
PFAS NEMP 2020 Recreational Water									**2**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																							
FTA	**PW341**	**08 Jan 2020**	**0089_QC206_200108**	**Interlab Duplicate**	**696100**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	160					21,000			500		1,300		440		12,000	
FTA	**PW341**	**31 Mar 2020**	**0089_PW341_200331**	**Normal**	**EP2003364**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	375	<1	375	608	698	19,200	6.87	2,850		577		1,620		720		11,900
FTA	**PW341**	**15 Jul 2020**	**0089_PW341_200715**	**Normal**	**EP2007383**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	187	<1	187	578	690	18,400	8.90	2,630		531		1,480		619		12,100
FTA	**PW341**	**22 Sep 2020**	**0089_PW341_200922**	**Normal**	**EP2010151**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	130	<1	130	614	729	19,600	8.54	2,810		510		1,620		685		12,700
FTA	**PW341**	**22 Sep 2020**	**0089_QC115_200922**	**Field Duplicate**	**EP2010151**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	132	<1	132	611	686	19,500	5.80	2,790		488		1,550		647		11,900
FTA	**PW341**	**22 Sep 2020**	**0089_QC215_200921**	**Interlab Duplicate**	**746269**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	120	<20	120			21,000			530		1,600		460		11,000	
FTA	**PW341**	**14 Dec 2020**	**0089_PW341_201214**	**Normal**	**EP2013988**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	141	<1	141	637	750	20,200	8.17	3,080		545		1,680		750		13,000
FTA	**PW341**	**15 Mar 2021**	**0089_PW341_210315**	**Normal**	**EP2102752**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	116	<1	116	662	744	21,200	5.81	2,960		513		1,640		689		13,000
FTA	**PW341**	**08 Jun 2021**	**0089_PW341_210608**	**Normal**	**EP2106450**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	562	660	17,800	7.97	2,780		463		1,470		607		11,500
FTA	**PW341**	**30 Aug 2021**	**0089_PW341_210830**	**Normal**	**EP2110021**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	534	553	17,100	1.81	2,340		406		1,240		556		9,580
FTA	**PW341**	**10 Jan 2022**	**0089_PW341_220110**	**Normal**	**EP2200212**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	102	<1	102	615	606	19,800	0.70	2,610		428		1,280		554		10,700
FTA	**PW341**	**14 Mar 2022**	**0089_PW341_220314**	**Normal**	**EP2202977**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	113	<1	113	646	692	20,800	3.43	2,730		488		1,570		633		12,000
FTA	**PW341**	**07 Jun 2022**	**0089_PW341_220607**	**Normal**	**EP2206881**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	178	<1	178	561	537	17,900	2.18	2,530		454		1,250		554		9,140
FTA	**PW341**	**05 Sep 2022**	**0089_PW341_220905**	**Normal**	**EP2211344**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	133	<1	133	583	611	18,700	2.27	2,560		424		1,370		611		10,600
FTA	**PW341**	**12 Dec 2022**	**0089_PW341_221212**	**Normal**	**EP2216879**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	231	<1	231	613	654	19,800	3.21	2,390		466		1,420		515		11,500
FTA	**PW341**	**13 Mar 2023**	**0089_PW341_230313**	**Normal**	**EP2303086**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	129	<1	129	641	682	20,500	3.07	2,910		470		1,480		579		12,000
FTA	**PW341**	**07 Jun 2023**	**0089_PW341_230607**	**Normal**	**EP2307502**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	167	<1	167	478	490	15,200	1.30	2,200		375		1,000		315		8,770
FTA	**PW341**	**05 Sep 2023**	**0089_PW341_230905**	**Normal**	**EP2312188**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	598	625	19,300	2.22	2,440		434		1,400		548		10,900
WWTP	**PW345**	**13 Apr 2018**	**0089_PW345_180413**	**Normal**	**209417**	<0.01	<0.002	<0.05																				
WWTP	**PW345**	**09 Jan 2020**	**0089_PW345_200109**	**Normal**	**EP2000249**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	154	<1	154	667	849	21,300	12.0	3,050		621		1,900		866		14,700
WWTP	**PW345**	**31 Mar 2020**	**0089_PW345_200331**	**Normal**	**EP2003374**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	404	<1	404	200	208	6,170	1.99	870		155		453		213		3,630
WWTP	**PW345**	**24 Sep 2020**	**0089_PW345_200924**	**Normal**	**EP2010271**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	438	<1	438	649	724	20,600	5.42	2,850		572		1,620		705		12,500
WWTP	**PW345**	**15 Dec 2020**	**0089_PW345_201215**	**Normal**	**EP2014053**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	425	<1	425	750	903	23,600	9.25	3,660		721		2,000		948		15,600
WWTP	**PW345**	**16 Mar 2021**	**0089_PW345_210316**	**Normal**	**EP2102834**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	277	<1	277	638	662	20,300	1.86	2,890		516		1,470		610		11,500
WWTP	**PW345**	**09 Jun 2021**	**0089_PW345_210609**	**Normal**	**EP2106517**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	145	<1	145	569	656	18,200	7.13	2,540		470		1,480		604		11,400
WWTP	**PW345**	**01 Sep 2021**	**0089_PW345_210901**	**Normal**	**EP2110154**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	490	<1	490	448	474	14,200	2.75	1,820		371		1,080		458		8,150
WWTP	**PW345**	**10 Jan 2022**	**0089_PW345_220110**	**Normal**	**EP2200215**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	446	<1	446	688	681	22,000	0.53	2,820		522		1,450		532		12,000
WWTP	**PW345**	**10 Jan 2022**	**0089_QC111_220110**	**Field Duplicate**	**EP2200215**	<0.05	<0.02	<0.05	0.02	0.02	0.02																	
WWTP	**PW345**	**10 Jan 2022**	**0089_QC211_220110**	**Interlab Duplicate**	**854607**	<0.05	<0.05	<0.05	0.02	<0.05	<0.1																	
WWTP	**PW345**	**14 Mar 2022**	**0089_PW345_220314**	**Normal**	**EP2202977**	<0.05	<0.02	<0.05	*0.19*	0.19	0.19	<1	148	<1	148	651	696	20,900	3.37	2,790		502		1,560		637		12,100
WWTP	**PW345**	**07 Jun 2022**	**0089_PW345_220607**	**Normal**	**EP2206884**	<0.05	<0.02	<0.05	*0.50*	0.50	0.50	<1	131	<1	131	658	618	21,400	3.21	2,510		473		1,430		594		10,600
WWTP	**PW345**	**05 Sep 2022**	**0089_PW345_220905**	**Normal**	**EP2211341**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	568	604	18,200	3.05	2,500		415		1,350		592		10,500
WWTP	**PW345**	**13 Dec 2022**	**0089_PW345_221213**	**Normal**	**EP2216930**	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	286	<1	286	491	477	15,700	1.39	2,020		367		1,040		411		8,340
WWTP	**PW345**	**14 Mar 2023**	**0089_PW345_230314**	**Normal**	**EP2303175**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	191	<1	191	700	768	22,300	4.61	3,220		528		1,670		645		13,500
WWTP	**PW345**	**07 Jun 2023**	**0089_PW345_230607**	**Normal**	**EP2307493**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	161	<1	161	522	616	16,700	8.26	2,300		384		1,100		418		11,400
WWTP	**PW345**	**05 Sep 2023**	**0089_PW345_230905**	**Normal**	**EP2312172**	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	152	<1	152	577	616	18,600	3.26	2,370		436		1,360		487		10,800
Accommodation Area	**PW346**	**17 Apr 2018**	**0089_PW346_180417**	**Normal**	**209522**	<0.01	<0.002	<0.05																				
Accommodation Area	**PW346**	**08 Jan 2020**	**0089_PW346_200108**	**Normal**	**EP2000186**	<0.05	<0.02	<0.05	***2.23***	2.33	2.40	<1	616	<1	616	209	223	6,390	3.28	803		202		493		227		3,840
Accommodation Area	**PW346**	**01 Apr 2020**	**0089_PW346_200401**	**Normal**	**EP2003438**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	883	<1	883	626	707	19,700	6.12	2,520		628		1,640		748		12,000
Accommodation Area	**PW346**	**15 Jul 2020**	**0089_PW346_200715**	**Normal**	**EP2007386**	<0.05	<0.02	<0.05	*0.10*	0.10	0.10	<1	160	<1	160	586	678	18,700	7.23	2,670		491		1,460		604		11,900
Accommodation Area	**PW346**	**22 Sep 2020**	**0089_PW346_200922**	**Normal**	**EP2010143**	<0.05	<0.02	<0.05	***5.62***	5.89	6.06	<1	337	<1	337	333	303	10,600	4.62	1,300		276		693		285		5,180
Accommodation Area	**PW346**	**15 Dec 2020**	**0089_PW346_201215**	**Normal**	**EP2014044**	<0.05	<0.02	<0.05	***3.16***	3.36	3.46	<1	153	<1	153	106	108	3,230	0.64	587		90		269		94		1,810
Accommodation Area	**PW346**	**17 Mar 2021**	**0089_PW346_210317**	**Normal**	**EP2102901**	<0.05	<0.02	<0.05	*0.12*	0.15	0.15	<1	465	<1	465	609	736	19,300	9.40	2,660		634		1,610		742		12,700
Accommodation Area	**PW346**	**10 Jun 2021**	**0089_PW346_210610**	**Normal**	**EP2106580**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	271	<1	271	554	600	17,600	4.06	2,490		469		1,380		608		10,300
Accommodation Area	**PW346**	**30 Aug 2021**	**0089_PW346_210830**	**Normal**	**EP2110017**	<0.05	<0.02	<0.05	*0.39*	0.39	0.39	<1	142	<1	142	529	571	16,900	3.87	2,370		429		1,290		569		9,870
Accommodation Area	**PW346**	**12 Jan 2022**	**0089_PW346_220112**	**Normal**	**EP2200289**	<0.05	<0.02	<0.05	***2.09***	2.20	2.23	<1	307	<1	307	534	570	16,900	3.20	2,480		406		1,240		490		10,000
Accommodation Area	**PW346**	**18 Mar 2022**	**0089_PW346_220318**	**Normal**	**EP2203195**	<0.05	<0.02	<0.05	*1.76*	1.88	1.94	<1	1,080	<1	1,080	307	317	9,480	1.64	875		302		724		327		5,390
Accommodation Area	**PW346**	**08 Jun 2022**	**0089_PW346_220608**	**Normal**	**EP2206973**	<0.05	<0.02	<0.05	*0.48*	0.49	0.49	<1	313	<1	313	621	675	19,600	4.18	2,960		531		1,600		647		11,500
Accommodation Area	**PW346**	**06 Sep 2022**	**0089_PW346_220906**	**Normal**	**EP2211391**	<0.05	<0.02	<0.05	*0.15*	0.17	0.17	<1	151	<1	151	537	615	17,100	6.75	2,480		463		1,380		494		10,700
Accommodation Area	**PW346**	**12 Dec 2022**	**0089_PW346_221212**	**Normal**	**EP2216879**	<0.05	<0.02	<0.05	***5.87***	6.04	6.13	4	242	<1	246	17.0	14.4	298	8.56	179		30		38		15		215
Accommodation Area	**PW346**	**12 Dec 2022**	**0089_QC118_221212**	**Field Duplicate**	**EP2216879**	<0.05	<0.02	<0.05	***7.32***	7.60	7.72	5	237	<1	242	16.2	13.6	268	8.60	181		30		36		14		202
Accommodation Area	**PW346**	**12 Dec 2022**	**0089_QC218_221212**	**Interlab Duplicate**	**950091**	<0.05	<0.05	<0.05	***7.52***	7.82	7.98																	
Accommodation Area	**PW346**	**14 Mar 2023**	**0089_PW346_230314**	**Normal**	**EP2303179**	<0.05	<0.02	<0.05	*0.23*	0.23	0.23	<1	681	<1	681	674	727	21,400	3.75	2,730		555		1,590		614		12,700
Accommodation Area	**PW346**	**14 Mar 2023**	**0089_QC118_230314**	**Field Duplicate**	**EP2303179**	<0.05	<0.02	<0.05	*0.43*	0.43	0.43	<1	672	<1	672	681	728	21,600	3.32	2,790		556		1,600		613		12,700
Accommodation Area	**PW346**	**14 Mar 2023**	**0089_QC218_230314**	**Interlab Duplicate**	**972487**	<0.05	<0.05	<0.05	*0.3*	0.3	0.3																	
Accommodation Area	**PW346**	**07 Jun 2023**	**0089_PW346_230607**	**Normal**	**EP2307502**	<0.05	<0.02	<0.05	*0.59*	0.59	0.59	<1	327	<1	327	544	558	17,300	1.31	2,360		522		1,150		333		9,860
Accommodation Area	**PW346**	**05 Sep 2023**	**0089_PW346_230905**	**Normal**	**EP2312178**	<0.05	<0.02	<0.05	0.26	0.26	0.26	<1	153	<1	153	556	603	17,800	4.05	2,430		430		1,350		523		10,500
WWTP	**PW350**	**19 Apr 2018**	**0089_PW350_180419**	**Normal**	**209623**	<0.01	<0.002	<0.05																				
WWTP	**PW350**	**30 Jan 2020**	**0089_PW350_200130**	**Normal**	**EP2001003**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	118	<1	118	630	675	20,200	3.43	2,800		469		1,510		560		11,800
WWTP	**PW350**	**02 Apr 2020**	**0089_PW350_200402**	**Normal**	**EP2003476**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	118	<1	118	605	704	19,300	7.51	2,810		509		1,610		758		12,100
WWTP	**PW350**	**21 Jul 2020**	**0089_PW350_200721**	**Normal**	**EP2007594**	<0.05	<0.02	<0.05	*0.11*	0.11	0.11	<1	126	<1	126	564	677	17,900	9.09	2,720		478		1,500		639		11,800
WWTP	**PW350**	**23 Sep 2020**	**0089_PW350_200923**	**Normal**	**EP2010220**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	120	<1	120	635	705	20,300	5.24	2,880		508		1,600		686		12,200
WWTP	**PW350**	**16 Dec 2020**	**0089_PW350_201216**	**Normal**	**EP2014090**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	118	<1	118	644	691	20,600	3.52	2,900		509		1,590		660		11,900
WWTP	**PW350**	**17 Mar 2021**	**0089_PW350_210317**	**Normal**	**EP2102901**	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	161	<1	161	680	733	21,700	3.74	3,110		527		1,640		750		12,700
WWTP	**PW350**	**08 Jun 2021**	**0089_PW350_210608**	**Normal**	**EP2106450**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	114	<1	114	567	670	18,000	8.31	2,730		462		1,480		622		11,700
WWTP	**PW350**	**30 Aug 2021**	**0089_PW350_210830**	**Normal**	**EP2110017**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	119	<1	119	559	595	17,800	3.16	2,600		431		1,340		595		10,300
WWTP	**PW350**	**11 Jan 2022**	**0089_PW350_220111**	**Normal**	**EP2200240**	<0.05	<0.02	<0.05	<0.01	<0.02	<0.02	<1	112	<1	112	618	642	19,900	1.89	2,620		427		1,410		510		11,300
WWTP	**PW350**	**14 Mar 2022**	**0089_PW350_220314**	**Normal**	**EP2202980**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	114	<1	114	573	674	18,600	8.10	2,210		471		1,530		612		11,700
WWTP	**PW350**	**07 Jun 2022**	**0089_PW350_220607**	**Normal**	**EP2206884**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	565	580	17,900	1.34	2,770		442		1,350		568		9,950
WWTP	**PW350**	**07 Sep 2022**	**0089_PW350_220907**	**Normal**	**EP2211496**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	119	<1	119	524	634	16,700	9.55	2,410		438		1,420		495		11,100
WWTP	**PW350**	**12 Dec 2022**	**0089_PW350_221212**	**Normal**	**EP2216877**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	134	<1	134	668	614	21,500	4.18	2,840		419		1,340		533		10,800
WWTP	**PW350**	**15 Mar 2023**	**0089_PW350_230315**	**Normal**	**EP2303229**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	125	<1	125	642	664	20,100	1.65	3,490		450		1,440		542		11,700
WWTP	**PW350**	**07 Jun 2023**	**0089_PW350_230607**	**Normal**	**EP2307493**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	117	<1	117	616	674	19,700	4.53	2,780		427		1,240		456		12,400
WWTP	**PW350**	**05 Sep 2023**	**0089_PW350_230905**	**Normal**	**EP2312184**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	591	648	19,000	4.62	2,530		436		1,430		510		11,400
WWTP	**PW351**	**19 Apr 2018**	**0089_PW351_180419**	**Normal**	**209623**	<0.01	<0.002	<0.05																				
WWTP	**PW351**	**30 Jan 2020**	**0089_PW351_200130**	**Normal**	**EP2001003**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	172	<1	172	623	667	19,900	3.38	2,810		462		1,470		546		11,700
WWTP	**PW351**	**02 Apr 2020**	**0089_PW351_200402**	**Normal**	**EP2003474**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	118	<1	118	589	711	18,700	9.37	2,850		517		1,640		765		12,200
WWTP	**PW351**	**21 Jul 2020**	**0089_PW351_200721**	**Normal**	**EP2007594**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	125	<1	125	576	684	18,300	8.56	2,760		481		1,530		648		11,900
WWTP	**PW351**	**23 Sep 2020**	**0089_PW351_200923**	**Normal**	**EP2010220**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	119	<1	119	630	707	20,200	5.72	2,800		509		1,620		690		12,200
WWTP	**PW351**	**16 Dec 2020**	**0089_PW351_201216**	**Normal**	**EP2014090**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	144	<1	144	629	695	20,100	4.95	2,860		506		1,590		659		12,000
WWTP	**PW351**	**17 Mar 2021**	**0089_PW351_210317**	**Normal**	**EP2102901**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	141	<1	141	660	708	21,100	3.49	3,000		507		1,580		702		12,300
WWTP	**PW351**	**08 Jun 2021**	**0089_PW351_210608**	**Normal**	**EP2106450**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	105	<1	105	568	660	18,000	7.48	2,790		459		1,470		613		11,500
WWTP	**PW351**	**30 Aug 2021**	**0089_PW351_210830**	**Normal**	**EP2110017**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	114	<1	114	550	599	17,600	4.23	2,490		429		1,340		595		10,400
WWTP	**PW351**	**11 Jan 2022**	**0089_PW351_220111**	**Normal**	**EP2200240**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	119	<1	119	616	641	19,900	1.99	2,510		428		1,400		505		11,300
WWTP	**PW351**	**14 Mar 2022**	**0089_PW351_220314**	**Normal**	**EP2202980**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	119	<1	119	593	675	19,000	6.48	2,630		478		1,540		619		11,700
WWTP	**PW351**	**07 Jun 2022**	**0089_PW351_220607**	**Normal**	**EP2206881**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	553	550	17,700	0.33	2,470		447		1,280		543		9,380
WWTP	**PW351**	**07 Sep 2022**	**0089_PW351_220907**	**Normal**	**EP2211496**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	120	<1	120	519	625	16,500	9.21	2,480		438		1,410		501		10,900
WWTP	**PW351**	**12 Dec 2022**	**0089_PW351_221212**	**Normal**	**EP2216873**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	136	<1	136	698	667	22,500	2.23	2,900		466		1,460		588		11,700
WWTP	**PW351**	**15 Mar 2023**	**0089_PW351_230315**	**Normal**	**EP2303229**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	122	<1	122	644	668	20,700	1.87	2,750		451		1,440		540		11,800
WWTP	**PW351**	**07 Jun 2023**	**0089_PW351_230607**	**Normal**	**EP2307493**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	117	<1	117	619	685	19,800	5.10	2,780		435		1,260		462		12,600
WWTP	**PW351**	**05 Sep 2023**	**0089_PW351_230905**	**Normal**	**EP2312184**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	571	637	18,300	5.50	2,510		428		1,410		504		11,200
WWTP	**PW352**	**19 Apr 2018**	**0089_PW352_180419**	**Normal**	**209623**	<0.01	<0.002	<0.05																				
WWTP	**PW352**	**30 Jan 2020**	**0089_PW352_200130**	**Normal**	**EP2001003**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	120	<1	120	646	663	20,800	1.30	2,720		465		1,470		551		11,600
WWTP	**PW352**	**02 Apr 2020**	**0089_PW352_200402**	**Normal**	**EP2003476**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	178	<1	178	612	710	19,500	7.42	2,800		514		1,630		762		12,200
WWTP	**PW352**	**21 Jul 2020**	**0089_PW352_200721**	**Normal**	**EP2007594**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	126	<1	126	567	679	18,000	8.97	2,720		478		1,520		641		11,800
WWTP	**PW352**	**23 Sep 2020**	**0089_PW352_200923**	**Normal**	**EP2010220**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	630	672	20,200	3.22	2,770		482		1,540		648		11,600
WWTP	**PW352**	**16 Dec 2020**	**0089_PW352_201216**	**Normal**	**EP2014090**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	114	<1	114	628	679	20,100	3.84	2,840		499		1,560		643		11,700
WWTP	**PW352**	**17 Mar 2021**	**0089_PW352_210317**	**Normal**	**EP2102901**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	656	691	21,000	2.55	2,960		493		1,540		689		12,000
WWTP	**PW352**	**08 Jun 2021**	**0089_PW352_210608**	**Normal**	**EP2106450**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	116	<1	116	568	676	18,000	8.70	2,770		469		1,500		620		11,800
WWTP	**PW352**	**30 Aug 2021**	**0089_PW352_210830**	**Normal**	**EP2110017**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	121	<1	121	556	599	17,800	3.71	2,500		433		1,340		594		10,400
WWTP	**PW352**	**11 Jan 2022**	**0089_PW352_220111**	**Normal**	**EP2200240**	<0.05	<0.02	<0.05	<0.01	<0.02	<0.02	<1

Table 2 - Porewater Analytical Results

					Ionamides			PFAS			Inorganics										Metals							
					N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) (as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.004	0.002	0.005	0.001	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water								*0.07*																			
PFAS NEMP 2020 Freshwater 99%																											
PFAS NEMP 2020 Recreational Water								**2**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																						
Demolition Ground	**PW356**	**15 Mar 2023**	**0089_PW356_230315**	**Normal**	**EP2303227**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	158	<1	158	608	669	19,400	4.75	2,780		485		1,480		550		11,700
Demolition Ground	**PW356**	**07 Jun 2023**	**0089_PW356_230607**	**Normal**	**EP2307498**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	259	<1	259	546	603	17,200	4.98	2,670		507		1,250		375		10,700
Demolition Ground	**PW356**	**07 Jun 2023**	**0089_QC116_230607**	**Field Duplicate**	**EP2307498**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	266	<1	266	542	604	17,200	5.40	2,460		502		1,250		402		10,700
Demolition Ground	**PW356**	**07 Jun 2023**	**0089_QC216_230607**	**Interlab Duplicate**	**997465**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
Demolition Ground	**PW356**	**11 Sep 2023**	**0089_PW356_230911**	**Normal**	**EP2312525**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	146	<1	146	572	653	18,300	6.63	2,540		455		1,470		534		11,400
Demolition Ground	**PW357**	**12 Apr 2018**	**0089_PW357_180412**	**Normal**	**209345**	<0.01	<0.002	<0.05																				
Demolition Ground	**PW357**	**09 Jan 2020**	**0089_QC203_200109**	**Interlab Duplicate**	**696324**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	120					26,000			560		1,600		530		15,000	
Demolition Ground	**PW357**	**10 Jan 2020**	**0089_PW357_200110**	**Normal**	**EP2000252**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	173	<1	173	717	896	22,900	11.1	3,240		634		2,020		924		15,500
Demolition Ground	**PW357**	**10 Jan 2020**	**0089_QC103_200110**	**Field Duplicate**	**EP2000252**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	172	<1	172	827	865	26,700	2.25	3,370		608		1,980		916		14,900
Demolition Ground	**PW357**	**30 Mar 2020**	**0089_PW357_200330**	**Normal**	**EP2003308**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	173	<1	173	634	771	20,200	9.73	2,920		587		1,800		752		13,200
Demolition Ground	**PW357**	**20 Jul 2020**	**0089_PW357_200720**	**Normal**	**EP2007544**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	189	<1	189	578	690	18,400	8.82	2,670		480		1,510		615		12,100
Demolition Ground	**PW357**	**23 Sep 2020**	**0089_PW357_200923**	**Normal**	**EP2010220**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	166	<1	166	630	671	20,100	3.18	2,860		481		1,530		656		11,600
Demolition Ground	**PW357**	**14 Dec 2020**	**0089_PW357_201214**	**Normal**	**EP2013989**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	625	710	19,900	6.39	2,930		504		1,610		681		12,300
Demolition Ground	**PW357**	**16 Mar 2021**	**0089_PW357_210316**	**Normal**	**EP2102836**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	142	<1	142	658	707	21,100	3.60	2,890		504		1,580		671		12,300
Demolition Ground	**PW357**	**08 Jun 2021**	**0089_PW357_210608**	**Normal**	**EP2106465**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	142	<1	142	590	657	18,900	5.37	2,600		490		1,470		616		11,400
Demolition Ground	**PW357**	**30 Aug 2021**	**0089_PW357_210830**	**Normal**	**EP2110017**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	536	578	17,100	3.74	2,460		425		1,300		572		10,000
Demolition Ground	**PW357**	**10 Jan 2022**	**0089_PW357_220110**	**Normal**	**EP2200218**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	120	<1	120	676	740	21,800	4.52	2,810		476		1,560		529		13,200
Demolition Ground	**PW357**	**15 Mar 2022**	**0089_PW357_220315**	**Normal**	**EP2203019**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	142	<1	142	617	669	19,900	4.02	2,560		470		1,520		630		11,600
Demolition Ground	**PW357**	**15 Mar 2022**	**0089_QC118_220315**	**Field Duplicate**	**EP2203019**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	134	<1	134	613	692	19,700	6.03	2,640		487		1,570		651		12,000
Demolition Ground	**PW357**	**15 Mar 2022**	**0089_QC218_220315**	**Interlab Duplicate**	**872903**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
Demolition Ground	**PW357**	**08 Jun 2022**	**0089_PW357_220608**	**Normal**	**EP2206970**							<1	275	<1	275	554	650	17,600	7.94	2,510		505		1,530		619		11,100
Demolition Ground	**PW357**	**08 Jun 2022**	**0089_PW357_220608**	**Normal**	**EP2208241**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01																	
Demolition Ground	**PW357**	**05 Sep 2022**	**0089_PW357_220905**	**Normal**	**EP2211347**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	151	<1	151	581	620	18,600	3.18	2,580		437		1,400		503		10,800
Demolition Ground	**PW357**	**12 Dec 2022**	**0089_PW357_221212**	**Normal**	**EP2216873**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	171	<1	171	606	674	19,300	5.28	2,810		463		1,440		574		11,900
Demolition Ground	**PW357**	**15 Mar 2023**	**0089_PW357_230315**	**Normal**	**EP2303227**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	138	<1	138	612	663	19,500	4.01	2,840		457		1,430		537		11,700
Demolition Ground	**PW357**	**07 Jun 2023**	**0089_PW357_230607**	**Normal**	**EP2307498**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	169	<1	169	543	600	17,200	5.00	2,620		487		1,220		396		10,700
Demolition Ground	**PW357**	**11 Sep 2023**	**0089_PW357_230911**	**Normal**	**EP2312525**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	144	<1	144	580	654	18,500	6.02	2,650		456		1,480		540		11,400
Demolition Ground	**PW358**	**12 Apr 2018**	**0089_PW358_180412**	**Normal**	**209345**	<0.01	<0.002	<0.05																				
Demolition Ground	**PW358**	**10 Jan 2020**	**0089_PW358_200110**	**Normal**	**EP2000252**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	176	<1	176	710	847	22,700	8.82	3,170		579		1,900		879		14,700
Demolition Ground	**PW358**	**30 Mar 2020**	**0089_PW358_200330**	**Normal**	**EP2003308**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	316	<1	316	665	879	21,000	13.8	3,200		771		1,970		857		15,100
Demolition Ground	**PW358**	**20 Jul 2020**	**0089_PW358_200720**	**Normal**	**EP2007544**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	555	641	17,700	7.20	2,550		448		1,420		568		11,200
Demolition Ground	**PW358**	**23 Sep 2020**	**0089_PW358_200923**	**Normal**	**EP2010217**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	175	<1	175	623	721	19,800	7.32	2,920		508		1,630		706		12,500
Demolition Ground	**PW358**	**14 Dec 2020**	**0089_PW358_201214**	**Normal**	**EP2013989**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	657	783	20,900	8.79	3,100		548		1,760		762		13,600
Demolition Ground	**PW358**	**16 Mar 2021**	**0089_PW358_210316**	**Normal**	**EP2102836**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	131	<1	131	663	689	21,200	1.92	2,990		489		1,530		646		12,000
Demolition Ground	**PW358**	**16 Mar 2021**	**0089_QC113_210316**	**Field Duplicate**	**EP2102836**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	137	<1	137	664	736	21,200	5.12	3,060		529		1,640		704		12,800
Demolition Ground	**PW358**	**16 Mar 2021**	**0089_QC213_210316**	**Interlab Duplicate**	**781350**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	170					19,000			520		1,400		440		11,000	
Demolition Ground	**PW358**	**08 Jun 2021**	**0089_PW358_210608**	**Normal**	**EP2106465**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	595	682	19,000	6.86	2,700		492		1,550		660		11,800
Demolition Ground	**PW358**	**08 Jun 2021**	**0089_QC107_210608**	**Field Duplicate**	**EP2106465**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	136	<1	136	596	674	19,000	6.19	2,740		498		1,510		638		11,700
Demolition Ground	**PW358**	**08 Jun 2021**	**0089_QC207_210608**	**Interlab Duplicate**	**802464**	<0.05	<0.05	<0.05	0.02	<0.05	<0.1	<10	140					20,000			560		1,400		470		11,000	
Demolition Ground	**PW358**	**30 Aug 2021**	**0089_PW358_210830**	**Normal**	**EP2110017**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	131	<1	131	537	618	17,100	7.01	2,480		457		1,380		614		10,700
Demolition Ground	**PW358**	**10 Jan 2022**	**0089_PW358_220110**	**Normal**	**EP2200218**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	148	<1	148	697	774	22,400	5.24	3,000		502		1,640		552		13,800
Demolition Ground	**PW358**	**15 Mar 2022**	**0089_PW358_220315**	**Normal**	**EP2203019**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	190	<1	190	612	692	19,600	6.18	2,650		494		1,570		650		12,000
Demolition Ground	**PW358**	**08 Jun 2022**	**0089_PW358_220608**	**Normal**	**EP2206970**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	245	<1	245	555	661	17,600	8.70	2,570		514		1,550		623		11,300
Demolition Ground	**PW358**	**05 Sep 2022**	**0089_PW358_220905**	**Normal**	**EP2211347**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	548	<1	548	581	633	18,500	4.26	2,320		535		1,430		562		10,900
Demolition Ground	**PW358**	**12 Dec 2022**	**0089_PW358_221212**	**Normal**	**EP2216873**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	273	<1	273	691	672	22,100	1.36	2,970		492		1,450		589		11,800
Demolition Ground	**PW358**	**15 Mar 2023**	**0089_PW358_230315**	**Normal**	**EP2303227**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	596	668	19,000	5.70	2,760		452		1,440		541		11,800
Demolition Ground	**PW358**	**07 Jun 2023**	**0089_PW358_230607**	**Normal**	**EP2307498**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	167	<1	167	543	618	17,400	6.46	2,360		522		1,260		397		11,000
Demolition Ground	**PW358**	**11 Sep 2023**	**0089_PW358_230911**	**Normal**	**EP2312525**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	132	<1	132	559	648	17,800	7.35	2,610		450		1,460		536		11,300
FTA	**PW362**	**13 Apr 2018**	**0089_PW362_180413**	**Normal**	**209417**	<0.01	<0.002	<0.05																				
FTA	**PW362**	**08 Jan 2020**	**0089_PW362_200108**	**Normal**	**EP2000179**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	232	<1	232	711	776	22,200	4.39	3,860		556		1,710		645		13,600
FTA	**PW362**	**31 Mar 2020**	**0089_PW362_200331**	**Normal**	**EP2003364**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	215	<1	215	555	671	17,500	9.47	2,750		509		1,550		710		11,500
FTA	**PW362**	**15 Jul 2020**	**0089_PW362_200715**	**Normal**	**EP2007383**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	596	717	19,100	9.20	2,630		510		1,540		650		12,600
FTA	**PW362**	**22 Sep 2020**	**0089_PW362_200922**	**Normal**	**EP2010151**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	132	<1	132	619	694	19,800	5.73	2,780		501		1,580		676		12,000
FTA	**PW362**	**14 Dec 2020**	**0089_PW362_201214**	**Normal**	**EP2013988**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	132	<1	132	630	665	20,000	2.71	3,040		499		1,510		618		11,500
FTA	**PW362**	**15 Mar 2021**	**0089_PW362_210315**	**Normal**	**EP2102758**	<0.05	<0.02	<0.05	*0.23*	0.23	0.23	<1	118	<1	118	614	749	19,500	9.88	2,960		512		1,650		688		13,100
FTA	**PW362**	**08 Jun 2021**	**0089_PW362_210608**	**Normal**	**EP2106450**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	128	<1	128	558	642	17,700	6.98	2,720		448		1,430		590		11,200
FTA	**PW362**	**30 Aug 2021**	**0089_PW362_210830**	**Normal**	**EP2110021**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	116	<1	116	535	584	17,100	4.38	2,420		425		1,320		586		10,100
FTA	**PW362**	**10 Jan 2022**	**0089_PW362_220110**	**Normal**	**EP2200212**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	114	<1	114	642	622	20,600	1.56	2,810		430		1,310		563		11,000
FTA	**PW362**	**14 Mar 2022**	**0089_PW362_220314**	**Normal**	**EP2202977**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	116	<1	116	633	692	20,300	4.46	2,770		489		1,570		632		12,000
FTA	**PW362**	**07 Jun 2022**	**0089_PW362_220607**	**Normal**	**EP2206881**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	156	<1	156	560	560	17,800	0.02	2,630		456		1,290		553		9,590
FTA	**PW362**	**07 Jun 2022**	**0089_QC110_220607**	**Field Duplicate**	**EP2206881**	<0.05	<0.02	<0.05	0.03	0.03	0.03																	
FTA	**PW362**	**07 Jun 2022**	**0089_QC210_220607**	**Interlab Duplicate**	**896805**	<0.004	<0.004	<0.008	0.031	0.033	0.033																	
FTA	**PW362**	**05 Sep 2022**	**0089_PW362_220905**	**Normal**	**EP2211344**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	127	<1	127	570	537	18,200	3.01	2,600		373		1,200		528		9,330
FTA	**PW362**	**05 Sep 2022**	**0089_QC108_220905**	**Field Duplicate**	**EP2211344**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	578	598	18,500	1.68	2,560		416		1,330		588		10,400
FTA	**PW362**	**05 Sep 2022**	**0089_QC208_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
FTA	**PW362**	**12 Dec 2022**	**0089_PW362_221212**	**Normal**	**EP2216879**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	168	<1	168	573	613	18,500	3.44	2,280		424		1,340		480		10,800
FTA	**PW362**	**12 Dec 2022**	**0089_QC107_221212**	**Field Duplicate**	**EP2216879**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	168	<1	168	561	623	18,100	5.23	2,280		429		1,350		485		11,000
FTA	**PW362**	**12 Dec 2022**	**0089_QC207_221212**	**Interlab Duplicate**	**950091**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
FTA	**PW362**	**13 Mar 2023**	**0089_PW362_230313**	**Normal**	**EP2303086**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	194	<1	194	758	797	24,200	2.49	3,430		545		1,740		676		14,000
FTA	**PW362**	**13 Mar 2023**	**0089_QC109_230313**	**Field Duplicate**	**EP2303086**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	198	<1	198	712	775	22,700	4.22	3,250		532		1,700		654		13,600
FTA	**PW362**	**13 Mar 2023**	**0089_QC209_230313**	**Interlab Duplicate**	**972487**	<0.05	<0.05	<0.05	0.02	<0.05	<0.1																	
FTA	**PW362**	**07 Jun 2023**	**0089_PW362_230607**	**Normal**	**EP2307502**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	152	<1	152	544	568	17,400	2.21	2,400		466		1,180		340		10,100
FTA	**PW362**	**05 Sep 2023**	**0089_PW362_230905**	**Normal**	**EP2312188**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	594	653	19,100	4.76	2,520		450		1,460		571		11,400
FTA	**PW363**	**13 Apr 2018**	**0089_PW363_180413**	**Normal**	**209417**	<0.01	<0.002	<0.05																				
FTA	**PW363**	**08 Jan 2020**	**0089_PW363_200108**	**Normal**	**EP2000179**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	435	<1	435	802	871	25,600	4.11	3,420		617		1,950		717		15,200
FTA	**PW363**	**31 Mar 2020**	**0089_PW363_200331**	**Normal**	**EP2003364**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	310	<1	310	384	446	12,000	7.47	1,890		366		1,030		469		7,610
FTA	**PW363**	**15 Jul 2020**	**0089_PW363_200715**	**Normal**	**EP2007383**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	222	<1	222	572	532	18,300	3.61	2,480		414		1,160		461		9,300
FTA	**PW363**	**22 Sep 2020**	**0089_PW363_200922**	**Normal**	**EP2010151**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	214	<1	214	699	732	22,600	2.33	2,760		530		1,650		700		12,700
FTA	**PW363**	**14 Dec 2020**	**0089_PW363_201214**	**Normal**	**EP2013988**	<0.05	<0.02	<0.05	*0.25*	0.25	0.25	<1	131	<1	131	633	707	20,100	5.52	3,030		517		1,610		692		12,200
FTA	**PW363**	**15 Mar 2021**	**0089_PW363_210315**	**Normal**	**EP2102752**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	122	<1	122	662	747	21,200	6.07	2,940		512		1,630		690		13,100
FTA	**PW363**	**08 Jun 2021**	**0089_PW363_210608**	**Normal**	**EP2106450**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	120	<1	120	563	654	17,800	7.51	2,810		461		1,460		602		11,400
FTA	**PW363**	**30 Aug 2021**	**0089_PW363_210830**	**Normal**	**EP2110021**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	127	<1	127	542	570	17,300	2.52	2,470		415		1,280		573		9,870
FTA	**PW363**	**10 Jan 2022**	**0089_PW363_220110**	**Normal**	**EP2200212**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	113	<1	113	621	596	20,000	2.08	2,610		425		1,260		543		10,500
FTA	**PW363**	**14 Mar 2022**	**0089_PW363_220314**	**Normal**	**EP2202977**	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	128	<1	128	639	732	20,600	6.76	2,670		515		1,660		673		12,700
FTA	**PW363**	**07 Jun 2022**	**0089_PW363_220607**	**Normal**	**EP2206881**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	128	<1	128	556	570	17,800	1.22	2,490		462		1,320		566		9,750
FTA	**PW363**	**05 Sep 2022**	**0089_PW363_220905**	**Normal**	**EP2211344**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	133	<1	133	583	611	18,600	2.34	2,670		429		1,370		614		10,600
FTA	**PW363**	**12 Dec 2022**	**0089_PW363_221212**	**Normal**	**EP2216879**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	199	<1	199	667	637	21,800	2.34	2,330		454		1,390		496		11,200
FTA	**PW363**	**13 Mar 2023**	**0089_PW363_230313**	**Normal**	**EP2303086**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	158	<1	158	720	785	23,000	4.36	3,250		542		1,710		670		13,800
FTA	**PW363**	**07 Jun 2023**	**0089_PW363_230607**	**Normal**	**EP2307502**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	126	<1	126	606	629	19,400	1.84	2,700		496		1,300		384		11,200
FTA	**PW363**	**05 Sep 2023**	**0089_PW363_230905**	**Normal**	**EP2312188**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	127	<1	127	586	642	18,800	4.52	2,580		441		1,440		564		11,200
FTA	**PW364**	**13 Apr 2018**	**0089_PW364_180413**	**Normal**	**209417**	<0.01	<0.002	<0.05																				
FTA	**PW364**	**09 Jan 2020**	**0089_PW364_200109**	**Normal**	**EP2000249**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	175	<1	175	672	754	21,600	5.76	2,820		495		1,690		612		13,200
FTA	**PW364**	**30 Mar 2020**	**0089_PW364_200330**	**Normal**	**EP2003333**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	289	<1	289	500	590	15,800	8.30	2,320		482		1,410		594		10,000
FTA	**PW364**	**30 Mar 2020**	**0089_QC105_200330**	**Field Duplicate**	**EP2003333**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	282	<1	282	497	564	15,700	6.29	2,320		459		1,340		568		9,560
FTA	**PW364**	**30 Mar 2020**	**0089_QC205_200330**	**Interlab Duplicate**	**711144**	<0.05	<0.05	<0.05	0.02	<0.05	<0.1	<20	370	<20	370			23,000			360		940		350		7,900	
FTA	**PW364**	**15 Jul 2020**	**0089_PW364_200715**	**Normal**	**EP2007383**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	128	<1	128	577	657	18,400	6.46	2,670		469		1,450		543		11,500
FTA	**PW364**	**22 Sep 2020**	**0089_PW364_200922**	**Normal**	**EP2010151**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	128	<1	128	623	725	19,900	7.55	2,840		517		1,620		688		12,600
FTA	**PW364**	**14 Dec 2020**	**0089_PW364_201214**	**Normal**	**EP2013985**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	150	<1	150	617	728	19,600	8.23	2,940		519		1,650		704		12,600
FTA	**PW364**	**15 Mar 2021**	**0089_PW364_210315**	**Normal**	**EP2102755**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	120	<1	120	669	735	21,500	4.69	2,880		510		1,640		685		12,800
FTA	**PW364**	**08 Jun 2021**	**0089_PW364_210608**	**Normal**	**EP2106465**	<0.05	<0.02	<0.05	0.02	0.09	0.09	<1	116	<1	116	585	639	18,700	4.41	2,670		461		1,440		592		11,100
FTA	**PW364**	**30 Aug 2021**	**0089_PW364_210830**	**Normal**	**EP2110021**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	118	<1	118	542	566	17,400	2.18	2,360		408		1,270		567		9,820
FTA	**PW364**	**30 Aug 2021**	**0089_QC106_210830**	**Field Duplicate**	**EP2110021**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	117	<1	117	546	576	17,500	2

Table 2 - Porewater Analytical Results

	Monitoring Area	Location Code	Date	Field ID	Sample Type	Lab Report Number	fonamides			PFAS			Inorganics									Metals							
							N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) (as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	LOR - Limit of Reporting						0.004	0.002	0.005	0.001	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	PFAS NEMP 2020 Drinking Water									*0.07*																			
	PFAS NEMP 2020 Freshwater 99%																												
	PFAS NEMP 2020 Recreational Water									**2**																			
	WWTP	**PW367**	**11 Jan 2022**	**0089_QC113_220111**	**Field Duplicate**	**EP2200240**	<0.05	<0.02	<0.05	0.07	0.07	0.07																	
	WWTP	**PW367**	**11 Jan 2022**	**0089_QC213_220111**	**Interlab Duplicate**	**855202**	<0.05	<0.05	<0.05	*0.08*	0.08	<0.1																	
	WWTP	**PW367**	**11 Jan 2022**	**0089-PW367_220111**	**Normal**	**EP2200240**	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	718	<1	718	658	693	21,000	2.56	2,490		554		1,520		550		12,100
	WWTP	**PW367**	**14 Mar 2022**	**0089_PW367_220314**	**Normal**	**EP2202977**	<0.05	<0.02	<0.05	0.01	0.01	0.01					657	716		4.32			556		1,610		662		12,400
	WWTP	**PW367**	**07 Jun 2022**	**0089_PW367_220607**	**Normal**	**EP2206884**	<0.05	<0.02	<0.05	*0.30*	0.30	0.30	<1	129	<1	129	582	598	18,600	1.39	2,620		459		1,370		567		10,300
	WWTP	**PW367**	**05 Sep 2022**	**0089_PW367_220905**	**Normal**	**EP2211341**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	128	<1	128	568	592	18,200	2.05	2,490		402		1,320		582		10,300
	WWTP	**PW367**	**05 Sep 2022**	**0089_QC110_220905**	**Field Duplicate**	**EP2211341**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	129	<1	129	551	592	17,700	3.56	2,370		407		1,320		582		10,300
	WWTP	**PW367**	**05 Sep 2022**	**0089_QC210_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
	WWTP	**PW367**	**13 Dec 2022**	**0089_PW367_221213**	**Normal**	**EP2216930**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	470	<1	470	391	364	12,300	3.54	1,650		305		828		309		6,270
	WWTP	**PW367**	**14 Mar 2023**	**0089_PW367_230314**	**Normal**	**EP2303175**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	219	<1	219	685	682	22,000	0.20	2,870		456		1,490		574		12,000
	WWTP	**PW367**	**07 Jun 2023**	**0089_PW367_230607**	**Normal**	**EP2307493**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	408	<1	408	454	489	14,400	3.69	1,900		332		875		338		9,000
	WWTP	**PW367**	**07 Jun 2023**	**0089_QC111_230607**	**Field Duplicate**	**EP2307493**	<0.05	<0.02	<0.05	0.02	0.02	0.02																	
	WWTP	**PW367**	**07 Jun 2023**	**0089_QC211_230607**	**Interlab Duplicate**	**997465**	<0.05	<0.05	<0.05	0.02	0.13	0.13																	
	WWTP	**PW367**	**05 Sep 2023**	**0089_PW367_230905**	**Normal**	**EP2312172**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	141	<1	141	574	621	18,500	3.88	2,390		429		1,370		491		10,900
	WWTP	**PW368**	**17 Apr 2018**	**0089_PW368_180417**	**Normal**	**209522**	<0.01	<0.002	<0.05																				
	WWTP	**PW368**	**08 Jan 2020**	**0089_PW368_200108**	**Normal**	**EP2000186**	<0.05	<0.02	<0.05	0.02	0.10	0.10	<1	256	<1	256	445	490	14,200	4.74	1,900		351		1,130		468		8,440
	WWTP	**PW368**	**01 Apr 2020**	**0089_PW368_200401**	**Normal**	**EP2003438**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	181	<1	181	480	529	15,200	4.81	2,300		389		1,230		568		9,050
	WWTP	**PW368**	**01 Apr 2020**	**0089_QC102_200401**	**Field Duplicate**	**EP2003438**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	179	<1	179	502	598	16,000	8.74	2,270		432		1,330		587		10,400
	WWTP	**PW368**	**01 Apr 2020**	**0089_QC202_200401**	**Interlab Duplicate**	**711709**	<0.05	<0.05	<0.05	0.01	<0.05	<0.1	<20	200	<20	200			17,000			380		1,100		380		9,000	
	WWTP	**PW368**	**20 Jul 2020**	**0089_PW368_200720**	**Normal**	**EP2007544**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	216	<1	216	502	591	16,000	8.17	2,220		460		1,300		518		10,300
	WWTP	**PW368**	**22 Sep 2020**	**0089_PW368_200922**	**Normal**	**EP2010143**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	208	<1	208	428	414	13,700	1.68	1,780		317		925		397		7,160
	WWTP	**PW368**	**15 Dec 2020**	**0089_PW368_201215**	**Normal**	**EP2014048**	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	258	<1	258	564	587	17,900	1.98	2,580		446		1,340		578		10,100
	WWTP	**PW368**	**15 Mar 2021**	**0089_PW368_210315**	**Normal**	**EP2102758**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	102	<1	102	592	707	18,800	8.83	2,860		481		1,540		645		12,400
	WWTP	**PW368**	**15 Mar 2021**	**0089_QC102_210315**	**Field Duplicate**	**EP2102758**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	112	<1	112	639	660	20,500	1.59	2,810		421		1,310		686		11,800
	WWTP	**PW368**	**15 Mar 2021**	**0089_QC202_210315**	**Interlab Duplicate**	**781350**	<0.05	<0.05	<0.05	0.02	<0.05	<0.1	<10	120					21,000			690		1,900		560		15,000	
	WWTP	**PW368**	**10 Jun 2021**	**0089_PW368_210610**	**Normal**	**EP2106582**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	219	<1	219	506	563	16,200	5.35	2,150		446		1,310		530		9,650
	WWTP	**PW368**	**01 Sep 2021**	**0089_PW368_210901**	**Normal**	**EP2110155**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	123	<1	123	552	646	17,800	7.77	2,300		458		1,460		599		11,200
	WWTP	**PW368**	**11 Jan 2022**	**0089_PW368_220111**	**Normal**	**EP2200240**	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	195	<1	195	278	277	8,810	0.22	1,240		206		623		226		4,820
	WWTP	**PW368**	**18 Mar 2022**	**0089_PW368_220318**	**Normal**	**EP2203195**	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	158	<1	158	607	639	19,400	2.52	2,740		471		1,440		547		11,100
	WWTP	**PW368**	**08 Jun 2022**	**0089_PW368_220608**	**Normal**	**EP2206973**	<0.05	<0.02	<0.05	*0.33*	0.33	0.33	<1	128	<1	128	601	676	19,100	5.91	2,850		489		1,590		639		11,600
	WWTP	**PW368**	**05 Sep 2022**	**0089_PW368_220905**	**Normal**	**EP2211344**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	369	<1	369	80.0	76.9	2,270	1.98	414		111		171		81		1,270
	WWTP	**PW368**	**05 Sep 2022**	**0089_QC118_220905**	**Field Duplicate**	**EP2211344**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	287	<1	287	488	482	15,600	0.62	2,050		394		1,100		456		8,290
	WWTP	**PW368**	**05 Sep 2022**	**0089_QC218_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	0.02	<0.05	<0.1																	
	WWTP	**PW368**	**12 Dec 2022**	**0089_PW368_221212**	**Normal**	**EP2216879**	<0.05	<0.02	<0.05	*0.26*	0.26	0.26	<1	314	<1	314	509	498	16,200	1.10	2,210		409		1,120		365		8,650
	WWTP	**PW368**	**12 Dec 2022**	**0089_QC116_221212**	**Field Duplicate**	**EP2216879**	<0.05	<0.02	<0.05	*0.22*	0.22	0.22	<1	308	<1	308	515	491	16,400	2.39	2,220		395		1,100		360		8,540
	WWTP	**PW368**	**12 Dec 2022**	**0089_QC216_221212**	**Interlab Duplicate**	**950091**	<0.05	<0.05	<0.05	*0.28*	0.28	0.28																	
	WWTP	**PW368**	**13 Mar 2023**	**0089_PW368_230313**	**Normal**	**EP2303086**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	902	<1	902	791	800	25,200	0.54	2,980		615		1,730		684		14,000
	WWTP	**PW368**	**07 Jun 2023**	**0089_PW368_230607**	**Normal**	**EP2307502**	<0.05	<0.02	<0.05	*0.15*	0.15	0.15	<1	198	<1	198	557	564	17,800	0.62	2,460		467		1,180		344		10,000
	WWTP	**PW368**	**05 Sep 2023**	**0089_PW368_230905**	**Normal**	**EP2312178**	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	225	<1	225	567	612	18,200	3.77	2,380		442		1,360		487		10,700
	WWTP	**PW369**	**17 Apr 2018**	**0089_PW369_180417**	**Normal**	**209522**	<0.01	<0.002	<0.05																				
	WWTP	**PW369**	**09 Jan 2020**	**0089_PW369_200109**	**Normal**	**EP2000249**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	136	<1	136	693	866	22,200	11.0	3,100		604		1,940		920		15,000
	WWTP	**PW369**	**31 Mar 2020**	**0089_PW369_200331**	**Normal**	**EP2003374**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	469	<1	469	186	177	5,680	2.56	801		166		444		167		2,940
	WWTP	**PW369**	**15 Jul 2020**	**0089_PW369_200715**	**Normal**	**EP2007383**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	128	<1	128	598	728	19,100	9.80	2,710		518		1,560		650		12,800
	WWTP	**PW369**	**24 Sep 2020**	**0089_PW369_200924**	**Normal**	**EP2010271**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	199	<1	199	636	692	20,300	4.28	2,840		519		1,550		670		12,000
	WWTP	**PW369**	**15 Dec 2020**	**0089_PW369_201215**	**Normal**	**EP2014053**	<0.05	<0.02	<0.05	*0.69*	0.89	0.89	<1	189	<1	189	625	701	19,800	5.74	3,020		528		1,590		698		12,100
	WWTP	**PW369**	**16 Mar 2021**	**0089_PW369_210316**	**Normal**	**EP2102834**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	179	<1	179	651	712	20,800	4.50	2,920		524		1,580		662		12,400
	WWTP	**PW369**	**09 Jun 2021**	**0089_PW369_210609**	**Normal**	**EP2106517**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	130	<1	130	581	692	18,600	8.70	2,600		491		1,570		645		12,000
	WWTP	**PW369**	**01 Sep 2021**	**0089_PW369_210901**	**Normal**	**EP2110154**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	317	<1	317	255	260	7,940	1.06	1,170		208		594		269		4,460
	WWTP	**PW369**	**01 Sep 2021**	**0089_QC118_210901**	**Field Duplicate**	**EP2110154**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	308	<1	308	248	262	7,740	2.78	1,120		208		598		276		4,490
	WWTP	**PW369**	**01 Sep 2021**	**0089_QC218_210901**	**Interlab Duplicate**	**822579**	<0.05	<0.05	<0.05	0.01	<0.05	<0.1																	
	WWTP	**PW369**	**10 Jan 2022**	**0089_PW369_220110**	**Normal**	**EP2200215**	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	207	<1	207	665	651	21,300	1.04	2,880		485		1,380		519		11,500
	WWTP	**PW369**	**14 Mar 2022**	**0089_PW369_220314**	**Normal**	**EP2202977**	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	163	<1	163	642	722	20,600	5.90	2,760		532		1,640		670		12,500
	WWTP	**PW369**	**07 Jun 2022**	**0089_PW369_220607**	**Normal**	**EP2206884**	<0.05	<0.02	<0.05	*0.20*	0.20	0.20	<1	139	<1	139	580	630	18,600	4.16	2,510		479		1,470		602		10,800
	WWTP	**PW369**	**05 Sep 2022**	**0089_PW369_220905**	**Normal**	**EP2211341**	<0.05	<0.02	<0.05	*0.11*	0.11	0.11	<1	124	<1	124	561	621	18,000	5.10	2,440		428		1,390		618		10,800
	WWTP	**PW369**	**13 Dec 2022**	**0089_PW369_221213**	**Normal**	**EP2216930**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	330	<1	330	558	560	17,900	0.14	2,250		418		1,230		489		9,780
	WWTP	**PW369**	**14 Mar 2023**	**0089_PW369_230314**	**Normal**	**EP2303175**	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	204	<1	204	761	850	24,200	5.52	3,550		586		1,870		714		14,900
	WWTP	**PW369**	**07 Jun 2023**	**0089_PW369_230607**	**Normal**	**EP2307493**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	162	<1	162	551	617	17,600	5.67	2,460		388		1,110		415		11,400
	WWTP	**PW369**	**05 Sep 2023**	**0089_PW369_230905**	**Normal**	**EP2312172**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	173	<1	173	572	632	18,300	5.02	2,500		448		1,390		495		11,100
		PW374	**18 Apr 2018**	**0089_PW374_180418**	**Normal**	**209573**	<0.01	<0.002	<0.05																				
		PW374	**08 Jan 2020**	**0089_PW374_200108**	**Normal**	**EP2000186**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	156	<1	156	616	708	19,700	6.93	2,750		459		1,590		574		12,400
		PW374	**08 Jan 2020**	**0089_QC108_200108**	**Field Duplicate**	**EP2000186**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	152	<1	152	645	733	20,800	6.33	2,670		484		1,660		591		12,800
		PW374	**08 Jan 2020**	**0089_QC208_200108**	**Interlab Duplicate**	**696100**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	180					20,000			460		1,300		430		12,000	
		PW374	**30 Mar 2020**	**0089_PW374_200330**	**Normal**	**EP2003313**	<0.05	<0.02	<0.05	*0.44*	0.44	0.44	<1	330	282	288	8,840	1.13	1,250		204		676		286		4,950
		PW374	**21 Jul 2020**	**0089_PW374_200721**	**Normal**	**EP2007611**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	569	673	18,100	8.39	2,690		479		1,510		636		11,700
		PW374	**21 Sep 2020**	**0089_PW374_200921**	**Normal**	**EP2010085**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	125	<1	125	552	635	17,400	7.03	2,800		422		1,460		602		11,000
		PW374	**21 Sep 2020**	**0089_QC103_200921**	**Field Duplicate**	**EP2010085**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	123	<1	123	565	677	17,900	8.96	2,790		446		1,570		640		11,700
		PW374	**21 Sep 2020**	**0089_QC203_200921**	**Interlab Duplicate**	**746269**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	160	<20	160			17,000			470		1,400		410		13,000	
		PW374	**14 Dec 2020**	**0089_PW374_201214**	**Normal**	**EP2013989**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	674	772	21,500	6.78	3,140		546		1,740		749		13,400
		PW374	**15 Mar 2021**	**0089_PW374_210315**	**Normal**	**EP2102758**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	119	<1	119	657	687	21,100	2.26	2,860		452		1,360		702		12,300
	Dredge spoil and Careening Bay	**PW374**	**15 Mar 2021**	**0089_QC106_210315**	**Field Duplicate**	**EP2102758**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	114	<1	114	591	721	18,800	9.88	2,820		499		1,590		668		12,600
		PW374	**15 Mar 2021**	**0089_QC206_210315**	**Interlab Duplicate**	**781350**	<0.05	<0.05	<0.05	*0.11*	0.13	0.13	<10	140					21,000			530		1,400		430		13,000	
		PW374	**10 Jun 2021**	**0089_PW374_210610**	**Normal**	**EP2106582**	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1	120	<1	120	578	662	18,500	6.78	2,600		462		1,500		618		11,500
		PW374	**01 Sep 2021**	**0089_PW374_210901**	**Normal**	**EP2110154**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	118	<1	118	548	620	17,700	6.17	2,240		436		1,390		566		10,800
		PW374	**13 Jan 2022**	**0089_PW374_220113**	**Normal**	**EP2200343**	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1	129	<1	129	612	686	19,700	5.72	2,560		455		1,530		593		12,000
		PW374	**16 Mar 2022**	**0089_PW374_220316**	**Normal**	**EP2203058**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	138	<1	138	634	647	20,400	1.01	2,700		454		1,480		618		11,200
		PW374	**09 Jun 2022**	**0089_PW374_220609**	**Normal**	**EP2207029**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	528	630	16,800	8.81	2,460		455		1,480		595		10,800
		PW374	**06 Sep 2022**	**0089_PW374_220906**	**Normal**	**EP2211391**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	127	<1	127	548	613	17,400	5.56	2,640		426		1,380		493		10,700
		PW374	**13 Dec 2022**	**0089_PW374_221213**	**Normal**	**EP2216934**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	636	659	20,600	1.80	2,510		437		1,430		589		11,600
		PW374	**14 Mar 2023**	**0089_PW374_230314**	**Normal**	**EP2303179**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	638	670	20,400	2.50	2,870		453		1,460		565		11,800
		PW374	**06 Jun 2023**	**0089_PW374_230606**	**Normal**	**EP2307434**	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	125	<1	125	643	718	20,600	5.53	2,860		434		1,340		484		13,200
		PW374	**06 Jun 2023**	**0089_QC108_230606**	**Field Duplicate**	**EP2307463**	<0.05	<0.02	<0.05	*0.12*	0.12	0.12																	
		PW374	**06 Jun 2023**	**0089_QC208_230606**	**Interlab Duplicate**	**997465**	<0.05	<0.05	<0.05	0.05	0.05	<0.1																	
		PW374	**04 Sep 2023**	**0089_PW374_230904**	**Normal**	**EP2312225**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	120	<1	120	602	617	19,300	1.23	2,660		436		1,420		515		10,700
		PW375	**18 Apr 2018**	**0089_PW375_180418**	**Normal**	**209573**	<0.01	<0.002	<0.05																				
		PW375	**08 Jan 2020**	**0089_PW375_200108**	**Normal**	**EP2000186**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	231	<1	231	372	444	11,800	8.74	1,670		333		990		481		7,660
		PW375	**30 Mar 2020**	**0089_PW375_200330**	**Normal**	**EP2003313**	<0.05	<0.02	<0.05	*0.09*	0.09	0.09	<1	139	<1	139	586	684	18,700	7.73	2,670		512		1,610		667		11,700
		PW375	**21 Jul 2020**	**0089_PW375_200721**	**Normal**	**EP2007611**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	124	<1	124	572	646	18,300	6.05	2,570		512		1,410		670		11,200
		PW375	**21 Sep 2020**	**0089_PW375_200921**	**Normal**	**EP2010085**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	123	<1	123	561	646	17,700	6.98	2,860		424		1,480		604		11,200
		PW375	**14 Dec 2020**	**0089_PW375_201214**	**Normal**	**EP2013989**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	120	<1	120	642	733	20,400	6.64	3,070		520		1,660		707		12,700
		PW375	**14 Dec 2020**	**0089_QC109_201214**	**Field Duplicate**	**EP2013989**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	117	<1	117	637	649	20,300	0.94	2,980		478		1,490		606		11,200
		PW375	**14 Dec 2020**	**0089_QC209_201114**	**Interlab Duplicate**	**765054**	<0.05	<0.05	<0.05	0.02	<0.05	<0.1	<10	150	<20	150			33,000			490		1,400		440		11,000	
		PW375	**15 Mar 2021**	**0089_PW375_210315**	**Normal**	**EP2102758**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	116	<1	116	642	672	20,600	2.28	2,800		435		1,340		692		12,000
	Dredge spoil and Careening Bay	**PW375**	**10 Jun 2021**	**0089_PW375_210610**	**Normal**	**EP2106582**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	118	<1	118	581	691	18,600	8.63	2,610		485		1,560		649		12,000
		PW375	**10 Jun 2021**	**0089_QC118_210610**	**Field Duplicate**	**EP2106582**	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	124	<1	124	576	692	18,400	9.11	2,640		483		1,570		654		12,000
		PW375	**10 Jun 2021**	**0089_QC218_210610**	**Interlab Duplicate**	**802734**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	130	<20	130			20,000			490		1,300		450		11,000	
		PW375	**01 Sep 2021**	**0089_PW375_210901**	**Normal**	**EP2110154**	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	119	<1	119	547	656	17,500	9.10	2,430		460		1,480		603		11,400
		PW375	**13 Jan 2022**	**0089_PW375_220113**	**Normal**	**EP2200343**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	137	<1	137	574	638	18,700	5.32	2,090		428		1,410		536		11,200
		PW375	**16 Mar 2022**	**0089_PW375_220316**	**Normal**	**EP2203058**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	183	<1	183	518	541	16,600	2.23	2,190		392		1,230		517		9,360
		PW375	**09 Jun 2022**	**0089_PW375_220609**	**Normal**	**EP2207029**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	627	630	20,300	0.22	2,480		456		1,480		593		10,800
		PW375	**06 Sep 2022**	**0089_PW375_220906**	**Normal**	**EP2211391**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	210	<1	210	523	561	16,700	3.54	2,290		416		1,270		468		9,750
		PW375	**13 Dec 2022**	**0089_PW375_221213**	**Normal**	**EP2217375**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	116	<1	116	680	655	21,800	1.90	3,030		451		1,430		572		11,500
		PW375	**14 Mar 2023**	**0089_PW375_230314**	**Normal**	**EP2303179**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	215	<1	215	506	521	16,100	1.49	2,290		351		1,140		438		9,170
		PW375	**06 Jun 2023**	**0089_PW375_230606**	**Normal**	**EP2307434**	<0.05	<0.02	<0.05	*0.65*	0.65	0.65	<1	123	<1	123	643	717	20,600	5.45	2,870		430		1,330		485		13,200
		PW375	**04 Sep 2023**	**0089_PW375_230904**	**Normal**	**EP2312225**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	595	610	19,200	1.18	2,470		425		1,390		509

Table 2 - Porewater Analytical Results

					Sulfonamides			PFAS			Inorganics									Metals							
					N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) (as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.004	0.002	0.005	0.001	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water								*0.07*																			
PFAS NEMP 2020 Freshwater 99%																											
PFAS NEMP 2020 Recreational Water								**2**																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																						
WWTP	**PW380**	**21 Jul 2020**	**0089_PW380_200721**	**Normal**	**EP2007594**	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	124	<1	124	576	678	18,300	8.05	2,780		475		1,510		638		11,800
WWTP	**PW380**	**23 Sep 2020**	**0089_PW380_200923**	**Normal**	**EP2010217**	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	122	<1	122	610	678	19,400	5.21	2,920		485		1,550		660		11,700
WWTP	**PW380**	**16 Dec 2020**	**0089_PW380_201216**	**Normal**	**EP2014090**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	639	673	20,400	2.60	2,950		498		1,550		645		11,600
WWTP	**PW380**	**17 Mar 2021**	**0089_PW380_210317**	**Normal**	**EP2102901**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	137	<1	137	708	719	22,700	0.76	3,140		510		1,600		723		12,500
WWTP	**PW380**	**08 Jun 2021**	**0089_PW380_210608**	**Normal**	**EP2106450**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	120	<1	120	588	657	18,800	5.57	2,640		466		1,480		630		11,400
WWTP	**PW380**	**30 Aug 2021**	**0089_PW380_210830**	**Normal**	**EP2110017**	<0.05	<0.02	<0.05	*0.14*	0.14	0.14	<1	119	<1	119	553	599	17,700	4.00	2,470		429		1,340		592		10,400
WWTP	**PW380**	**11 Jan 2022**	**0089_PW380_220111**	**Normal**	**EP2200240**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	114	<1	114	606	659	19,500	4.13	2,600		430		1,450		522		11,600
WWTP	**PW380**	**14 Mar 2022**	**0089_PW380_220314**	**Normal**	**EP2202980**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	119	<1	119	575	680	18,300	8.33	2,710		474		1,540		621		11,800
WWTP	**PW380**	**07 Jun 2022**	**0089_PW380_220607**	**Normal**	**EP2206881**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	132	<1	132	569	576	18,200	0.64	2,530		467		1,340		580		9,830
WWTP	**PW380**	**07 Sep 2022**	**0089_PW380_220907**	**Normal**	**EP2211496**	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	115	<1	115	522	613	16,600	7.99	2,470		426		1,380		484		10,700
WWTP	**PW380**	**12 Dec 2022**	**0089_PW380_221212**	**Normal**	**EP2216877**	<0.05	<0.02	<0.05	*0.09*	0.09	0.09	<1	131	<1	131	683	666	22,000	1.31	2,880		453		1,450		574		11,700
WWTP	**PW380**	**15 Mar 2023**	**0089_PW380_230315**	**Normal**	**EP2303229**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	626	673	20,100	3.67	2,700		453		1,450		544		11,900
WWTP	**PW380**	**07 Jun 2023**	**0089_PW380_230607**	**Normal**	**EP2307493**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	118	<1	118	628	665	20,100	2.90	2,800		419		1,240		453		12,200
WWTP	**PW380**	**05 Sep 2023**	**0089_PW380_230905**	**Normal**	**EP2312184**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	608	636	19,600	2.32	2,500		425		1,400		500		11,200
WWTP	**PW381**	**19 Apr 2018**	**0089_PW381_180419**	**Normal**	**209623**	<0.01	<0.002	<0.05																			
WWTP	**PW381**	**30 Jan 2020**	**0089_PW381_200130**	**Normal**	**EP2001003**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	120	<1	120	634	668	20,300	2.63	2,810		460		1,480		552		11,700
WWTP	**PW381**	**02 Apr 2020**	**0089_PW381_200402**	**Normal**	**EP2003474**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	119	<1	119	643	729	20,600	6.28	2,860		510		1,660		745		12,600
WWTP	**PW381**	**21 Jul 2020**	**0089_PW381_200721**	**Normal**	**EP2007594**	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	125	<1	125	578	683	18,400	8.34	2,720		482		1,520		649		11,900
WWTP	**PW381**	**23 Sep 2020**	**0089_PW381_200923**	**Normal**	**EP2010217**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	188	<1	188	612	686	19,400	5.72	2,920		480		1,550		661		11,900
WWTP	**PW381**	**16 Dec 2020**	**0089_PW381_201216**	**Normal**	**EP2014104**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	113	<1	113	626	665	20,000	3.08	2,840		475		1,520		635		11,500
WWTP	**PW381**	**17 Mar 2021**	**0089_PW381_210317**	**Normal**	**EP2102901**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	632	697	20,200	4.87	2,870		504		1,550		696		12,100
WWTP	**PW381**	**08 Jun 2021**	**0089_PW381_210608**	**Normal**	**EP2106450**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	115	<1	115	568	660	18,000	7.48	2,780		458		1,470		613		11,500
WWTP	**PW381**	**30 Aug 2021**	**0089_PW381_210830**	**Normal**	**EP2110017**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	119	<1	119	554	640	17,700	7.22	2,490		462		1,430		631		11,100
WWTP	**PW381**	**11 Jan 2022**	**0089_PW381_220111**	**Normal**	**EP2200240**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	118	<1	118	615	626	19,800	0.87	2,600		420		1,380		499		11,000
WWTP	**PW381**	**14 Mar 2022**	**0089_PW381_220314**	**Normal**	**EP2202980**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	118	<1	118	568	644	18,300	6.20	2,400		459		1,490		602		11,100
WWTP	**PW381**	**07 Jun 2022**	**0089_PW381_220607**	**Normal**	**EP2206884**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	550	640	17,600	7.59	2,440		481		1,480		615		11,000
WWTP	**PW381**	**07 Sep 2022**	**0089_PW381_220907**	**Normal**	**EP2211496**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	120	<1	120	524	612	16,700	7.74	2,450		421		1,380		487		10,700
WWTP	**PW381**	**12 Dec 2022**	**0089_PW381_221212**	**Normal**	**EP2216877**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	124	<1	124	681	647	22,000	2.58	2,800		435		1,400		557		11,400
WWTP	**PW381**	**15 Mar 2023**	**0089_PW381_230315**	**Normal**	**EP2303229**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	697	659	22,600	2.80	2,750		449		1,440		539		11,600
WWTP	**PW381**	**07 Jun 2023**	**0089_PW381_230607**	**Normal**	**EP2307493**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	116	<1	116	616	669	19,700	4.13	2,770		421		1,230		450		12,300
WWTP	**PW381**	**05 Sep 2023**	**0089_PW381_230905**	**Normal**	**EP2312184**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	599	638	19,300	3.12	2,500		431		1,410		502		11,200
WWTP	**PW401**	**19 Apr 2018**	**0089_PW379_180419**	**Normal**	**209623**	<0.01	<0.002	<0.05																			
WWTP	**PW401**	**30 Jan 2020**	**0089_PW401_200130**	**Normal**	**EP2001003**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	623	663	19,900	3.12	2,850		453		1,480		556		11,600
WWTP	**PW401**	**02 Apr 2020**	**0089_PW401_200402**	**Normal**	**EP2003474**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	117	<1	117	586	686	18,600	7.85	2,840		496		1,570		735		11,800
WWTP	**PW401**	**21 Jul 2020**	**0089_PW401_200721**	**Normal**	**EP2007594**	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	124	<1	124	578	650	18,400	5.94	2,690		462		1,460		616		11,300
WWTP	**PW401**	**23 Sep 2020**	**0089_PW401_200923**	**Normal**	**EP2010220**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	118	<1	118	636	701	20,400	4.87	2,800		499		1,610		683		12,100
WWTP	**PW401**	**16 Dec 2020**	**0089_PW401_201216**	**Normal**	**EP2014090**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	632	667	20,200	2.66	2,890		493		1,530		635		11,500
WWTP	**PW401**	**17 Mar 2021**	**0089_PW401_210317**	**Normal**	**EP2102901**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	663	675	21,200	0.91	2,980		487		1,510		680		11,700
WWTP	**PW401**	**08 Jun 2021**	**0089_PW401_210608**	**Normal**	**EP2106450**	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	116	<1	116	573	653	18,200	6.51	2,760		450		1,450		598		11,400
WWTP	**PW401**	**30 Aug 2021**	**0089_PW401_210830**	**Normal**	**EP2110017**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	118	<1	118	548	628	17,500	6.79	2,490		453		1,400		617		10,900
WWTP	**PW401**	**11 Jan 2022**	**0089_PW401_220111**	**Normal**	**EP2200240**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	114	<1	114	615	642	19,800	2.11	2,620		426		1,410		510		11,300
WWTP	**PW401**	**14 Mar 2022**	**0089_PW401_220314**	**Normal**	**EP2202980**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	127	<1	127	584	656	18,700	5.74	2,610		456		1,480		593		11,400
WWTP	**PW401**	**07 Jun 2022**	**0089_PW401_220607**	**Normal**	**EP2206881**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	555	577	17,700	1.97	2,550		469		1,330		568		9,880
WWTP	**PW401**	**07 Sep 2022**	**0089_PW401_220907**	**Normal**	**EP2211496**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	119	<1	119	523	628	16,600	9.11	2,510		429		1,400		492		11,000
WWTP	**PW401**	**12 Dec 2022**	**0089_PW401_221212**	**Normal**	**EP2216877**	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	128	<1	128	673	615	21,700	4.51	2,820		419		1,350		526		10,800
WWTP	**PW401**	**15 Mar 2023**	**0089_PW401_230315**	**Normal**	**EP2303229**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	627	675	20,100	3.64	2,780		460		1,460		548		11,900
WWTP	**PW401**	**07 Jun 2023**	**0089_PW401_230607**	**Normal**	**EP2307493**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	116	<1	116	620	661	19,900	3.17	2,720		418		1,190		450		12,200
WWTP	**PW401**	**05 Sep 2023**	**0089_PW401_230905**	**Normal**	**EP2312184**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	600	643	19,300	3.41	2,560		427		1,420		506		11,300
HSF	**PW405**	**14 Jan 2020**	**0089_PW405_200114**	**Normal**	**EP2000432**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	658	790	21,000	9.07	3,050		551		1,770		809		13,700
HSF	**PW405**	**01 Apr 2020**	**0089_PW405_200401**	**Normal**	**EP2003417**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	166	<1	166	677	770	21,700	6.38	2,980		575		1,800		736		13,200
HSF	**PW405**	**22 Jul 2020**	**0089_PW405_200722**	**Normal**	**EP2007648**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	150	<1	150	600	585	19,300	1.24	2,510		397		1,250		558		10,300
HSF	**PW405**	**21 Sep 2020**	**0089_PW405_200921**	**Normal**	**EP2010085**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	136	<1	136	563	716	17,700	11.9	2,930		516		1,610		701		12,400
HSF	**PW405**	**21 Sep 2020**	**0089_QC110_200921**	**Field Duplicate**	**EP2010085**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	139	<1	139	566	721	17,900	12.0	2,820		520		1,620		706		12,500
HSF	**PW405**	**21 Sep 2020**	**0089_QC210_200921**	**Interlab Duplicate**	**746269**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	120	<20	120			19,000			470		1,300		410		12,000	
HSF	**PW405**	**15 Dec 2020**	**0089_PW405_201215**	**Normal**	**EP2014048**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	133	<1	133	647	704	20,700	4.18	2,910		505		1,580		692		12,200
HSF	**PW405**	**15 Mar 2021**	**0089_PW405_210315**	**Normal**	**EP2102752**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	105	<1	105	662	709	21,200	3.45	2,950		486		1,560		660		12,400
HSF	**PW405**	**10 Jun 2021**	**0089_PW405_210610**	**Normal**	**EP2106590**	<0.05	<0.02	<0.05	<0.01	0.11	0.14	<1	206	<1	206	164	159	5,130	1.26	707		254		378		135		2,580
HSF	**PW405**	**10 Jun 2021**	**0089_QC115_210610**	**Field Duplicate**	**EP2106590**	<0.05	<0.02	<0.05	<0.01	0.12	0.12	<1	190	<1	190	173	154	5,440	5.61	750		246		366		131		2,500
HSF	**PW405**	**10 Jun 2021**	**0089_QC215_210610**	**Interlab Duplicate**	**802734**	<0.05	<0.05	<0.05	<0.01	0.11	0.11	<10	200	<20	200			6,400			300		440		120		3,300	
HSF	**PW405**	**31 Aug 2021**	**0089_PW405_210831**	**Normal**	**EP2110065**	<0.05	<0.02	<0.05	<0.01	0.04	0.04	<1	132	<1	132	558	581	17,900	2.01	2,410		407		1,310		515		10,100
HSF	**PW405**	**31 Aug 2021**	**0089_QC117_210831**	**Field Duplicate**	**EP2110065**	<0.05	<0.02	<0.05	<0.01	0.02	0.02	<1	133	<1	133	549	592	17,600	3.75	2,400		417		1,330		531		10,300
HSF	**PW405**	**31 Aug 2021**	**0089_QC217_210831**	**Interlab Duplicate**	**821197**	<0.05	<0.05	<0.05	<0.01	0.05	<0.1																	
HSF	**PW405**	**14 Jan 2022**	**0089_PW405_220114**	**Normal**	**EP2200400**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	626	663	20,100	2.93	2,700		457		1,470		588		11,600
HSF	**PW405**	**16 Mar 2022**	**0089_PW405_220316**	**Normal**	**EP2203058**	<0.05	<0.02	<0.05	<0.01	0.08	0.08	<1	157	<1	157	650	705	20,800	4.02	2,910		488		1,610		682		12,200
HSF	**PW405**	**07 Jun 2022**	**0089_PW405_220607**	**Normal**	**EP2206887**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	599	703	19,200	7.97	2,640		505		1,640		644		12,100
HSF	**PW405**	**07 Sep 2022**	**0089_PW405_220907**	**Normal**	**EP2211496**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	117	<1	117	515	623	16,400	9.53	2,400		434		1,400		487		10,900
HSF	**PW405**	**13 Dec 2022**	**0089_PW405_221213**	**Normal**	**EP2216930**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	155	<1	155	648	684	20,900	2.75	2,650		486		1,490		610		12,000
HSF	**PW405**	**14 Mar 2023**	**0089_PW405_230314**	**Normal**	**EP2303179**	<0.05	<0.02	<0.05	0.01	0.67	0.75	<1	129	<1	129	614	664	19,600	3.93	2,800		450		1,440		552		11,700
HSF	**PW405**	**08 Jun 2023**	**0089_PW405_230608**	**Normal**	**EP2307592**	<0.05	<0.02	<0.05	<0.01	0.08	0.08	<1	130	<1	130	592	612	18,900	1.67	2,720		465		1,230		377		11,000
HSF	**PW405**	**05 Sep 2023**	**0089_PW405_230905**	**Normal**	**EP2312184**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	585	641	18,800	4.54	2,520		441		1,430		560		11,200
HSF	**PW407**	**14 Jan 2020**	**0089_PW407_200114**	**Normal**	**EP2000432**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	174	<1	174	622	762	19,800	10.2	2,860		536		1,720		783		13,200
HSF	**PW407**	**01 Apr 2020**	**0089_PW407_200401**	**Normal**	**EP2003417**	<0.05	<0.02	<0.05	0.02	1.46	1.46	<1	206	<1	206	536	617	17,100	7.02	2,390		455		1,380		606		10,700
HSF	**PW407**	**22 Jul 2020**	**0089_PW407_200722**	**Normal**	**EP2007648**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	156	<1	156	524	549	16,700	2.30	2,390		376		1,170		523		9,660
HSF	**PW407**	**21 Sep 2020**	**0089_PW407_200921**	**Normal**	**EP2010085**	<0.05	<0.02	<0.05	<0.01	0.01	0.01	<1	133	<1	133	566	674	17,800	8.74	2,930		449		1,540		630		11,700
HSF	**PW407**	**15 Dec 2020**	**0089_PW407_201215**	**Normal**	**EP2014053**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	136	<1	136	638	710	20,200	5.39	3,130		516		1,600		700		12,300
HSF	**PW407**	**15 Mar 2021**	**0089_PW407_210315**	**Normal**	**EP2102752**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	110	<1	110	649	714	20,800	4.77	2,890		488		1,570		659		12,500
HSF	**PW407**	**10 Jun 2021**	**0089_PW407_210610**	**Normal**	**EP2106590**	<0.05	<0.02	<0.05	<0.01	<0.01	0.02	<1	189	<1	189	537	611	17,200	6.46	2,310		445		1,370		597		10,600
HSF	**PW407**	**31 Aug 2021**	**0089_PW407_210831**	**Normal**	**EP2110065**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	135	<1	135	556	581	17,800	2.22	2,440		408		1,310		521		10,100
HSF	**PW407**	**14 Jan 2022**	**0089_PW407_220114**	**Normal**	**EP2200400**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	101	<1	101	633	664	20,400	2.38	2,690		457		1,480		593		11,600
HSF	**PW407**	**16 Mar 2022**	**0089_PW407_220316**	**Normal**	**EP2203058**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	110	<1	110	616	664	19,600	3.74	2,950		458		1,520		636		11,500
HSF	**PW407**	**07 Jun 2022**	**0089_PW407_220607**	**Normal**	**EP2206887**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	195	<1	195	477	564	15,000	8.40	2,400		416		1,320		517		9,700
HSF	**PW407**	**07 Sep 2022**	**0089_PW407_220907**	**Normal**	**EP2211498**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	554	606	17,700	4.48	2,520		420		1,360		481		10,600
HSF	**PW407**	**13 Dec 2022**	**0089_PW407_221213**	**Normal**	**EP2216930**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	194	<1	194	600	703	19,000	7.96	2,870		496		1,550		624		12,300
HSF	**PW407**	**14 Mar 2023**	**0089_PW407_230314**	**Normal**	**EP2303179**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	252	<1	252	550	546	17,200	0.35	2,850		381		1,200		456		9,570
HSF	**PW407**	**08 Jun 2023**	**0089_PW407_230608**	**Normal**	**EP2307592**	<0.05	<0.02	<0.05	<0.01	0.08	0.08	<1	130	<1	130	590	597	18,800	0.58	2,750		470		1,200		368		10,700
HSF	**PW407**	**05 Sep 2023**	**0089_PW407_230905**	**Normal**	**EP2312184**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	578	642	18,600	5.28	2,420		443		1,440		561		11,200
HSF	**PW407**	**05 Sep 2023**	**0089_QC112_230905**	**Field Duplicate**	**EP2312184**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	132	<1	132	591	685	19,000	7.38	2,520		469		1,520		577		12,000
HSF	**PW407**	**05 Sep 2023**	**0089_QC212_230905**	**Interlab Duplicate**	**1023399**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1																	
HSF	**PW409**	**14 Jan 2020**	**0089_PW409_200114**	**Normal**	**EP2000432**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	138	<1	138	651	774	20,700	8.59	3,100		551		1,740		783		13,400
HSF	**PW409**	**01 Apr 2020**	**0089_PW409_200401**	**Normal**	**EP2003417**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	145	<1	145	625	760	20,000	9.74	2,800		554		1,690		763		13,200
HSF	**PW409**	**21 Jul 2020**	**0089_PW409_200721**	**Normal**	**EP2007611**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	137	<1	137	552	622	17,500	6.02	2,650		485		1,360		641		10,800
HSF	**PW409**	**22 Sep 2020**	**0089_PW409_200922**	**Normal**	**EP2010143**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	626	662	20,100	2.79	2,740		455		1,450		622		11,600
HSF	**PW409**	**22 Sep 2020**	**0089_QC113_200922**	**Field Duplicate**	**EP2010143**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	611	662	19,600	3.94	2,690		455		1,440		620		11,600
HSF	**PW409**	**22 Sep 2020**	**0089_QC213_200921**	**Interlab Duplicate**	**746269**	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1	<10	110	<20	110			18,000			440		1,300		400		11,000	
HSF	**PW409**	**15 Dec 2020**	**0089_PW409_201215**	**Normal**	**EP2014044**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	615	724	19,600	8.14	2,850		504		1,620		667		12,600
HSF	**PW409**	**17 Mar 2021**	**0089_PW409_210317**	**Normal**	**EP2102901**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	138	<1	138	714	828	22,800	7.43	3,270		585		1,840		844		14,400
HSF	**PW409**	**10 Jun 2021**	**0089_PW409_210610**	**Normal**	**EP2106590**	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	113	<1	113	583	658	18,700	5.99	2,580		475		1,480		642		11,400
HSF	**PW409**	**31 Aug 2021**	**0089_PW409_210831**	**Normal**	**EP2110065**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	553	586	17,700	2.90	2,470		414		1,320		521		10,200
HSF	**PW409**	**14 Jan 2022**	**0089_PW409_220114**	**Normal**	**EP2200400**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	631	654	20,300	1.81	2,660		460		1,460		584		11,400
HSF	**PW409**	**16 Mar 2022**	**0089_PW409_220316**	**Normal**	**EP2203058**	<0.05	<0.02

Table 2 - Porewater Analytical Results

						Sulfonamides			PFAS			Inorganics									Metals							
						N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.004	0.002	0.005	0.001	0.001	0.001	1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water									*0.07*																		
PFAS NEMP 2020 Freshwater 99%																											
PFAS NEMP 2020 Recreational Water									**2**																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																						
HSF	**PW413**	**21 Jul 2020**	**0089_PW413_200721**	**Normal**	**EP2007611**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	202	<1	202	574	696	18,200	9.64	2,700		615		1,520		717		12,000
HSF	**PW413**	**22 Sep 2020**	**0089_PW413_200922**	**Normal**	**EP2010143**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	96	<1	96	604	611	19,400	0.53	2,660		412		1,340		576		10,700
HSF	**PW413**	**15 Dec 2020**	**0089_PW413_201215**	**Normal**	**EP2014044**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	616	720	19,600	7.84	2,900		496		1,590		658		12,600
HSF	**PW413**	**18 Mar 2021**	**0089_PW413_210318**	**Normal**	**EP2102941**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	198	<1	198	615	680	19,500	5.09	2,910		501		1,530		638		11,800
HSF	**PW413**	**09 Jun 2021**	**0089_PW413_210609**	**Normal**	**EP2106519**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	118	<1	118	587	673	18,800	6.87	2,590		477		1,510		634		11,700
HSF	**PW413**	**01 Sep 2021**	**0089_PW413_210901**	**Normal**	**EP2110155**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	113	<1	113	549	621	17,700	6.18	2,280		434		1,400		575		10,800
HSF	**PW413**	**14 Jan 2022**	**0089_PW413_220114**	**Normal**	**EP2200400**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	654	676	21,100	1.63	2,710		472		1,500		607		11,800
HSF	**PW413**	**16 Mar 2022**	**0089_PW413_220316**	**Normal**	**EP2203058**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	111	<1	111	631	658	20,100	2.10	2,960		452		1,500		628		11,400
HSF	**PW413**	**07 Jun 2022**	**0089_PW413_220607**	**Normal**	**EP2206887**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	545	605	17,400	5.25	2,480		441		1,420		554		10,400
HSF	**PW413**	**06 Sep 2022**	**0089_PW413_220906**	**Normal**	**EP2211401**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	582	608	18,600	2.18	2,640		435		1,370		492		10,600
HSF	**PW413**	**14 Dec 2022**	**0089_PW413_221214**	**Normal**	**EP2216973**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	116	<1	116	642	706	20,800	4.74	2,560		487		1,540		623		12,400
HSF	**PW413**	**15 Mar 2023**	**0089_PW413_230315**	**Normal**	**EP2303229**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	120	<1	120	632	675	20,200	3.29	2,880		451		1,470		549		11,900
HSF	**PW413**	**08 Jun 2023**	**0089_PW413_230608**	**Normal**	**EP2307593**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	150	<1	150	594	590	18,900	0.32	2,780		473		1,220		369		10,500
HSF	**PW413**	**04 Sep 2023**	**0089_PW413_230904**	**Normal**	**EP2312225**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	133	<1	133	586	624	18,600	3.07	2,840		441		1,440		522		10,800
HSF	**PW415**	**14 Jan 2020**	**0089_PW415_200114**	**Normal**	**EP2000432**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	616	739	19,600	9.06	2,930		537		1,660		748		12,800
HSF	**PW415**	**01 Apr 2020**	**0089_PW415_200401**	**Normal**	**EP2003417**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	213	<1	213	276	296	8,650	3.44	1,340		274		734		320		4,910
HSF	**PW415**	**21 Jul 2020**	**0089_PW415_200721**	**Normal**	**EP2007611**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	148	<1	148	570	669	18,200	7.98	2,600		536		1,460		700		11,600
HSF	**PW415**	**22 Sep 2020**	**0089_PW415_200922**	**Normal**	**EP2010145**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	608	665	19,400	4.51	2,790		484		1,510		648		11,500
HSF	**PW415**	**15 Dec 2020**	**0089_PW415_201215**	**Normal**	**EP2014044**	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	126	<1	126	619	730	19,700	8.25	2,910		505		1,640		684		12,700
HSF	**PW415**	**18 Mar 2021**	**0089_PW415_210318**	**Normal**	**EP2102941**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	143	<1	143	410	402	12,900	0.98	2,080		294		881		392		7,010
HSF	**PW415**	**09 Jun 2021**	**0089_PW415_210609**	**Normal**	**EP2106519**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	579	703	18,500	9.64	2,630		499		1,580		666		12,200
HSF	**PW415**	**01 Sep 2021**	**0089_PW415_210901**	**Normal**	**EP2110155**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	116	<1	116	555	638	17,900	6.92	2,310		447		1,430		592		11,100
HSF	**PW415**	**14 Jan 2022**	**0089_PW415_220114**	**Normal**	**EP2200400**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	114	<1	114	641	630	20,700	0.85	2,650		436		1,410		558		11,000
HSF	**PW415**	**16 Mar 2022**	**0089_PW415_220316**	**Normal**	**EP2203058**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	174	<1	174	535	545	16,900	0.89	2,640		390		1,260		532		9,380
HSF	**PW415**	**07 Jun 2022**	**0089_PW415_220607**	**Normal**	**EP2206887**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	142	<1	142	572	617	18,300	3.80	2,540		447		1,450		561		10,600
HSF	**PW415**	**06 Sep 2022**	**0089_PW415_220906**	**Normal**	**EP2211401**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	135	<1	135	588	630	18,800	3.51	2,630		446		1,420		507		11,000
HSF	**PW415**	**14 Dec 2022**	**0089_PW415_221214**	**Normal**	**EP2216973**	<0.05	<0.02	<0.05	**0.01**	**0.01**	**0.01**	<1	161	<1	161	594	664	19,200	5.52	2,380		481		1,460		592		11,600
HSF	**PW415**	**15 Mar 2023**	**0089_PW415_230315**	**Normal**	**EP2303229**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	169	<1	169	614	679	19,600	5.04	2,760		455		1,460		551		12,000
HSF	**PW415**	**08 Jun 2023**	**0089_PW415_230608**	**Normal**	**EP2307593**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	120	<1	120	602	702	19,300	7.66	2,670		420		1,320		453		12,900
HSF	**PW415**	**04 Sep 2023**	**0089_PW415_230904**	**Normal**	**EP2312225**	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	568	619	18,200	4.29	2,500		432		1,440		519		10,700

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Freshwater 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:
First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Freshwater 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
FTA	**SW130**	**17 Jul 2017**	**0089_SW130_170717**	**Normal**	**198331**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
FTA	**SW130**	**08 Jan 2020**	**0089_SW130_200108**	**Normal**	**EP2000180**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**30 Mar 2020**	**0089_SW130_200330**	**Normal**	**EP2003316**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**15 Jul 2020**	**0089_SW130_200715**	**Normal**	**EP2007383**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**22 Sep 2020**	**0089_SW130_200922**	**Normal**	**EP2010153**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**14 Dec 2020**	**0089_SW130_201214**	**Normal**	**EP2013985**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	0.09	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**15 Mar 2021**	**0089_SW130_210315**	**Normal**	**EP2102756**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**08 Jun 2021**	**0089_SW130_210608**	**Normal**	**EP2106465**	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**30 Aug 2021**	**0089_SW130_210830**	**Normal**	**EP2110021**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**10 Jan 2022**	**0089_SW130_220110**	**Normal**	**EP2200215**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**14 Mar 2022**	**0089_SW130_220314**	**Normal**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**07 Jun 2022**	**0089_SW130_220607**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**05 Sep 2022**	**0089_SW130_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**12 Dec 2022**	**0089_SW130_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**13 Mar 2023**	**0089_QC102_230313**	**Field Duplicate**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**13 Mar 2023**	**0089_QC202_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW130**	**13 Mar 2023**	**0089_SW130_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**07 Jun 2023**	**0089_SW130_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW130**	**05 Sep 2023**	**0089_SW130_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**17 Jul 2017**	**0089_QC1SW_170717**	**Field Duplicate**	**198331**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
FTA	**SW132**	**17 Jul 2017**	**0089_QC2SW_170717**	**Interlab Duplicate**	**555139**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW132**	**17 Jul 2017**	**0089_SW132_170717**	**Normal**	**198331**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
FTA	**SW132**	**08 Jan 2020**	**0089_SW132_200108**	**Normal**	**EP2000180**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**30 Mar 2020**	**0089_SW132_200330**	**Normal**	**EP2003316**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**15 Jul 2020**	**0089_QC103_200715**	**Field Duplicate**	**EP2007383**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**15 Jul 2020**	**0089_QC203_200215**	**Interlab Duplicate**	**732844**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW132**	**15 Jul 2020**	**0089_SW132_200715**	**Normal**	**EP2007383**	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**22 Sep 2020**	**0089_SW132_200922**	**Normal**	**EP2010153**	<0.02	<0.02	0.03	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**14 Dec 2020**	**0089_QC107_201214**	**Field Duplicate**	**EP2013988**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**14 Dec 2020**	**0089_QC207_201114**	**Interlab Duplicate**	**765054**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW132**	**14 Dec 2020**	**0089_SW132_201214**	**Normal**	**EP2013988**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**15 Mar 2021**	**0089_SW132_210315**	**Normal**	**EP2102756**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**08 Jun 2021**	**0089_SW132_210608**	**Normal**	**EP2106465**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**30 Aug 2021**	**0089_SW132_210830**	**Normal**	**EP2110021**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**10 Jan 2022**	**0089_SW132_220110**	**Normal**	**EP2200215**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**14 Mar 2022**	**0089_SW132_220314**	**Normal**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**07 Jun 2022**	**0089_SW132_220607**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**05 Sep 2022**	**0089_QC104_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**05 Sep 2022**	**0089_QC204_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW132**	**05 Sep 2022**	**0089_SW132_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**12 Dec 2022**	**0089_QC104_221212**	**Field Duplicate**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**12 Dec 2022**	**0089_QC204_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW132**	**12 Dec 2022**	**0089_SW132_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**13 Mar 2023**	**0089_SW132_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**07 Jun 2023**	**0089_SW132_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW132**	**05 Sep 2023**	**0089_SW132_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**17 Jul 2017**	**0089_SW134_170717**	**Normal**	**198331**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
FTA	**SW134**	**08 Jan 2020**	**0089_QC109_200108**	**Field Duplicate**	**EP2000180**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**08 Jan 2020**	**0089_QC209_200108**	**Interlab Duplicate**	**696100**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW134**	**08 Jan 2020**	**0089_SW134_200108**	**Normal**	**EP2000180**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**31 Mar 2020**	**0089_QC101_200331**	**Field Duplicate**	**EP2003367**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**31 Mar 2020**	**0089_QC201_200331**	**Interlab Duplicate**	**711434**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW134**	**31 Mar 2020**	**0089_SW134_200331**	**Normal**	**EP2003367**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**15 Jul 2020**	**0089_SW134_200715**	**Normal**	**EP2007383**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**22 Sep 2020**	**0089_QC116_200922**	**Field Duplicate**	**EP2010153**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**22 Sep 2020**	**0089_QC216_200921**	**Interlab Duplicate**	**746269**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW134**	**22 Sep 2020**	**0089_SW134_200922**	**Normal**	**EP2010153**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**14 Dec 2020**	**0089_SW134_201214**	**Normal**	**EP2013988**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**15 Mar 2021**	**0089_SW134_210315**	**Normal**	**EP2102756**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**08 Jun 2021**	**0089_QC110_210608**	**Field Duplicate**	**EP2106450**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**08 Jun 2021**	**0089_QC210_210608**	**Interlab Duplicate**	**802464**	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW134**	**08 Jun 2021**	**0089_SW134_210608**	**Normal**	**EP2106450**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**30 Aug 2021**	**0089_QC104_210830**	**Field Duplicate**	**EP2110021**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**30 Aug 2021**	**0089_QC204_210830**	**Interlab Duplicate**	**820919**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW134**	**30 Aug 2021**	**0089_SW134_210830**	**Normal**	**EP2110021**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**10 Jan 2022**	**0089_QC102_220110**	**Field Duplicate**	**EP2200212**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**10 Jan 2022**	**0089_QC202_220110**	**Interlab Duplicate**	**854607**	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW134**	**10 Jan 2022**	**0089_SW134_220110**	**Normal**	**EP2200212**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**14 Mar 2022**	**0089_QC107_220314**	**Field Duplicate**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**14 Mar 2022**	**0089_QC207_220314**	**Interlab Duplicate**	**872911**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW134**	**14 Mar 2022**	**0089_SW134_220314**	**Normal**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**07 Jun 2022**	**0089_QC108_220607**	**Field Duplicate**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**07 Jun 2022**	**0089_QC208_220607**	**Interlab Duplicate**	**896805**	<0.002	<0.002	0.003	<0.002	0.027	<0.004	<0.008	<0.002	0.002	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
FTA	**SW134**	**07 Jun 2022**	**0089_SW134_220607**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**05 Sep 2022**	**0089_SW134_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**12 Dec 2022**	**0089_QC112_221212**	**Field Duplicate**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**12 Dec 2022**	**0089_QC212_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	**SW134**	**12 Dec 2022**	**0089_SW134_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**13 Mar 2023**	**0089_SW134_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**07 Jun 2023**	**0089_SW134_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
FTA	**SW134**	**05 Sep 2023**	**0089_SW134_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**24 Aug 2017**	**0089_SW150_170824**	**Normal**	**199846**	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
Demolition Ground	**SW150**	**08 Jan 2020**	**0089_SW150_200108**	**Normal**	**EP2000180**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**30 Mar 2020**	**0089_SW150_200330**	**Normal**	**EP2003309**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**20 Jul 2020**	**0089_SW150_200720**	**Normal**	**EP2007545**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**23 Sep 2020**	**0089_SW150_200923**	**Normal**	**EP2010218**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**14 Dec 2020**	**0089_SW150_201214**	**Normal**	**EP2013973**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**16 Mar 2021**	**0089_SW150_210316**	**Normal**	**EP2102836**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**08 Jun 2021**	**0089_QC109_210608**	**Field Duplicate**	**EP2106465**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**08 Jun 2021**	**0089_QC209_210608**	**Interlab Duplicate**	**802464**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**08 Jun 2021**	**0089_SW150_210608**	**Normal**	**EP2106465**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**30 Aug 2021**	**0089_QC108_210830**	**Field Duplicate**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**30 Aug 2021**	**0089_QC208_210830**	**Interlab Duplicate**	**820919**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**30 Aug 2021**	**0089_SW150_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**10 Jan 2022**	**0089_SW150_220110**	**Normal**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**15 Mar 2022**	**0089_QC117_220315**	**Field Duplicate**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**15 Mar 2022**	**0089_QC217_220315**	**Interlab Duplicate**	**872903**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Table 3 - Surface water Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Freshwater 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
Demolition Ground	**SW150**	**08 Jun 2022**	**0089_SW150_220608**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**05 Sep 2022**	**0089_SW150_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**12 Dec 2022**	**0089_SW150_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**15 Mar 2023**	**0089_SW150_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**07 Jun 2023**	**0089_QC115_230607**	**Field Duplicate**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**07 Jun 2023**	**0089_QC215_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**07 Jun 2023**	**0089_SW150_230607**	**Normal**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**11 Sep 2023**	**0089_SW150_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**24 Aug 2017**	**0089_SW152_170824**	**Normal**	**199846**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
Demolition Ground	**SW152**	**08 Jan 2020**	**0089_SW152_200108**	**Normal**	**EP2000180**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**30 Mar 2020**	**0089_SW152_200330**	**Normal**	**EP2003309**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**20 Jul 2020**	**0089_SW152_200720**	**Normal**	**EP2007545**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**23 Sep 2020**	**0089_SW152_200923**	**Normal**	**EP2010218**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**14 Dec 2020**	**0089_SW152_201214**	**Normal**	**EP2013973**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**16 Mar 2021**	**0089_SW152_210316**	**Normal**	**EP2102836**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**08 Jun 2021**	**0089_SW152_210608**	**Normal**	**EP2106465**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**30 Aug 2021**	**0089_SW152_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**10 Jan 2022**	**0089_SW152_220110**	**Normal**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**15 Mar 2022**	**0089_SW152_220315**	**Normal**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**08 Jun 2022**	**0089_SW152_220608**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**08 Jun 2022**	**0089_SW152_220608**	**Normal**	**EP2208241**																	
Demolition Ground	**SW152**	**05 Sep 2022**	**0089_QC103_220905**	**Field Duplicate**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**05 Sep 2022**	**0089_QC203_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**05 Sep 2022**	**0089_SW152_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**12 Dec 2022**	**0089_SW152_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**15 Mar 2023**	**0089_SW152_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**07 Jun 2023**	**0089_SW152_230607**	**Normal**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**11 Sep 2023**	**0089_SW152_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**24 Aug 2017**	**0089_SW154_170824**	**Normal**	**199846**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
Demolition Ground	**SW154**	**08 Jan 2020**	**0089_QC104_200108**	**Field Duplicate**	**EP2000180**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**08 Jan 2020**	**0089_QC204_200108**	**Interlab Duplicate**	**696100**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**08 Jan 2020**	**0089_SW154_200108**	**Normal**	**EP2000180**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**30 Mar 2020**	**0089_SW154_200330**	**Normal**	**EP2003309**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**20 Jul 2020**	**0089_SW154_200720**	**Normal**	**EP2007545**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**22 Sep 2020**	**0089_SW154_200922**	**Normal**	**EP2010153**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**14 Dec 2020**	**0089_SW154_201214**	**Normal**	**EP2013989**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**16 Mar 2021**	**0089_SW154_210316**	**Normal**	**EP2102836**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**08 Jun 2021**	**0089_SW154_210608**	**Normal**	**EP2106465**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**30 Aug 2021**	**0089_SW154_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**10 Jan 2022**	**0089_SW154_220110**	**Normal**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**15 Mar 2022**	**0089_QC113_220315**	**Field Duplicate**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**15 Mar 2022**	**0089_QC213_220315**	**Interlab Duplicate**	**872903**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**15 Mar 2022**	**0089_SW154_220315**	**Normal**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**08 Jun 2022**	**0089_SW154_220608**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**05 Sep 2022**	**0089_SW154_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**12 Dec 2022**	**0089_QC109_221212**	**Field Duplicate**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**12 Dec 2022**	**0089_QC209_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**12 Dec 2022**	**0089_SW154_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**15 Mar 2023**	**0089_SW154_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**07 Jun 2023**	**0089_SW154_230607**	**Normal**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**11 Sep 2023**	**0089_SW154_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**24 Aug 2017**	**0089_SW156_170824**	**Normal**	**199846**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
Demolition Ground	**SW156**	**08 Jan 2020**	**0089_SW156_200108**	**Normal**	**EP2000180**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**30 Mar 2020**	**0089_SW156_200330**	**Normal**	**EP2003309**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**20 Jul 2020**	**0089_SW156_200720**	**Normal**	**EP2007545**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**23 Sep 2020**	**0089_SW156_200923**	**Normal**	**EP2010218**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**14 Dec 2020**	**0089_SW156_201214**	**Normal**	**EP2013989**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**16 Mar 2021**	**0089_QC111_210316**	**Field Duplicate**	**EP2102836**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**16 Mar 2021**	**0089_QC211_210316**	**Interlab Duplicate**	**781350**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**16 Mar 2021**	**0089_SW156_210316**	**Normal**	**EP2102836**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**08 Jun 2021**	**0089_SW156_210608**	**Normal**	**EP2106465**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**30 Aug 2021**	**0089_SW156_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**10 Jan 2022**	**0089_QC107_220110**	**Field Duplicate**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**10 Jan 2022**	**0089_QC207_220110**	**Interlab Duplicate**	**854607**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**10 Jan 2022**	**0089_SW156_220110**	**Normal**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**15 Mar 2022**	**0089_SW156_220315**	**Normal**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**08 Jun 2022**	**0089_SW156_220608**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**05 Sep 2022**	**0089_SW156_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**12 Dec 2022**	**0089_SW156_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**15 Mar 2023**	**0089_SW156_230315**	**Normal**	**EP2303227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**07 Jun 2023**	**0089_SW156_230607**	**Normal**	**EP2307498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**11 Sep 2023**	**0089_SW156_230911**	**Normal**	**EP2312525**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**17 Apr 2018**	**0089_SW305_180417**	**Normal**	**209522**	<0.001	<0.001	0.003	<0.001	0.008	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
WWTP	**SW305**	**08 Jan 2020**	**0089_SW305_200108**	**Normal**	**EP2000183**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**31 Mar 2020**	**0089_SW305_200331**	**Normal**	**EP2003372**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**20 Jul 2020**	**0089_SW305_200720**	**Normal**	**EP2007545**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**22 Sep 2020**	**0089_SW305_200922**	**Normal**	**EP2010145**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**15 Dec 2020**	**0089_SW305_201215**	**Normal**	**EP2014048**	<0.02	<0.02	<0.02	<0.02	0.13	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**15 Mar 2021**	**0089_SW305_210315**	**Normal**	**EP2102758**	<0.02	<0.02	0.03	<0.02	0.37	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**10 Jun 2021**	**0089_SW305_210610**	**Normal**	**EP2106582**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**01 Sep 2021**	**0089_SW305_210901**	**Normal**	**EP2110154**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**11 Jan 2022**	**0089_SW305_220111**	**Normal**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**18 Mar 2022**	**0089_SW305_220318**	**Normal**	**EP2203195**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**08 Jun 2022**	**0089_SW305_220608**	**Normal**	**EP2206973**	<0.02	<0.02	0.01	<0.02	0.22	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**05 Sep 2022**	**0089_QC115_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**05 Sep 2022**	**0089_QC215_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP	**SW305**	**05 Sep 2022**	**0089_SW305_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**12 Dec 2022**	**0089_SW305_221212**	**Normal**	**EP2216879**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**13 Mar 2023**	**0089_QC114_230313**	**Field Duplicate**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**13 Mar 2023**	**0089_QC214_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP	**SW305**	**13 Mar 2023**	**0089_SW305_230313**	**Normal**	**EP2303086**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**07 Jun 2023**	**0089_SW305_230607**	**Normal**	**EP2307502**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW305**	**05 Sep 2023**	**0089_SW305_230905**	**Normal**	**EP2312178**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW309**	**18 Apr 2018**	**0089_SW309_180418**	**Normal**	**209573**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
HSF	**SW309**	**10 Jan 2020**	**0089_QC101_200110**	**Field Duplicate**	**EP2000292**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW309**	**10 Jan 2020**	**0089_QC201_200110**	**Interlab Duplicate**	**696578**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	**SW309**	**10 Jan 2020

Table 3 - Surface water Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Freshwater 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
HSF	SW309	15 Dec 2020	0089_QC112_201215	Field Duplicate	EP2014048	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW309	15 Dec 2020	0089_QC212_201115	Interlab Duplicate	765054	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	SW309	15 Dec 2020	0089_SW309_201215	Normal	EP2014048	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW309	17 Mar 2021	0089_SW309_210317	Normal	EP2102892	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW309	09 Jun 2021	0089_SW309_210609	Normal	EP2106519	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW309	31 Aug 2021	0089_QC114_210831	Field Duplicate	EP2110065	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW309	31 Aug 2021	0089_QC214_210831	Interlab Duplicate	821197	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	SW309	31 Aug 2021	0089_SW309_210831	Normal	EP2110065	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW309	13 Jan 2022	0089_SW309_220113	Normal	EP2200338	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW309	16 Mar 2022	0089_SW309_220316	Normal	EP2203058	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW309	07 Jun 2022	0089_SW309_220607	Normal	EP2206887	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW309	06 Sep 2022	0089_SW309_220906	Normal	EP2211401	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW309	13 Dec 2022	0089_SW309_221213	Normal	EP2217375	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW309	14 Mar 2023	0089_SW309_230314	Normal	EP2303175	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW309	08 Jun 2023	0089_SW309_230608	Normal	EP2307590	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW309	04 Sep 2023	0089_SW309_230904	Normal	EP2312228	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	30 Apr 2018	0089_SW310_180430	Normal	209959	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
HSF	SW310	10 Jan 2020	0089_SW310_200110	Normal	EP2000292	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	31 Mar 2020	0089_SW310_200331	Normal	EP2003369	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	22 Jul 2020	0089_SW310_200722	Normal	EP2007649	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	23 Sep 2020	0089_SW310_200923	Normal	EP2010222	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	15 Dec 2020	0089_SW310_201215	Normal	EP2014048	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	17 Mar 2021	0089_SW310_210317	Normal	EP2102890	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	09 Jun 2021	0089_SW310_210609	Normal	EP2106519	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	31 Aug 2021	0089_SW310_210831	Normal	EP2110065	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	13 Jan 2022	0089_SW310_220113	Normal	EP2200338	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	16 Mar 2022	0089_SW310_220316	Normal	EP2203058	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	07 Jun 2022	0089_QC103_220607	Field Duplicate	EP2206887	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	07 Jun 2022	0089_QC203_220607	Interlab Duplicate	896805	<0.002	<0.002	<0.002	<0.002	0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
HSF	SW310	07 Jun 2022	0089_SW310_220607	Normal	EP2206887	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	06 Sep 2022	0089_SW310_220906	Normal	EP2211401	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	13 Dec 2022	0089_SW310_221213	Normal	EP2216930	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	14 Mar 2023	0089_SW310_230314	Normal	EP2303175	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	08 Jun 2023	0089_SW310_230608	Normal	EP2307590	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW310	04 Sep 2023	0089_SW310_230904	Normal	EP2312228	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	30 Apr 2018	0089_SW311_180430	Normal	209959	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
HSF	SW311	01 Apr 2020	0089_SW311_200401	Normal	EP2003418	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	22 Jul 2020	0089_SW311_200722	Normal	EP2007649	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	23 Sep 2020	0089_SW311_200923	Normal	EP2010222	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	15 Dec 2020	0089_SW311_201215	Normal	EP2014053	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	17 Mar 2021	0089_SW311_210317	Normal	EP2102892	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	09 Jun 2021	0089_SW311_210609	Normal	EP2106519	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	31 Aug 2021	0089_SW311_210831	Normal	EP2110072	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	13 Jan 2022	0089_SW311_220113	Normal	EP2200338	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	16 Mar 2022	0089_SW311_220316	Normal	EP2203058	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	07 Jun 2022	0089_SW311_220607	Normal	EP2206887	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	06 Sep 2022	0089_SW311_220906	Normal	EP2211401	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	13 Dec 2022	0089_SW311_221213	Normal	EP2216930	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	14 Mar 2023	0089_SW311_230314	Normal	EP2303175	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	08 Jun 2023	0089_SW311_230608	Normal	EP2307590	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	SW311	04 Sep 2023	0089_SW311_230904	Normal	EP2312228	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Dredge spoil and Careening Bay	SW317	17 Apr 2018	0089_SW317_180417	Normal	209522	<0.001	<0.001	0.001	<0.001	0.007	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	SW317	08 Jan 2020	0089_SW317_200108	Normal	EP2000183	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	10 Jan 2020	0089_SW317_200110	Normal	EP2000292	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	30 Mar 2020	0089_SW317_200330	Normal	EP2003314	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	21 Jul 2020	0089_SW317_200721	Normal	EP2007604	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	21 Sep 2020	0089_SW317_200921	Normal	EP2010083	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	14 Dec 2020	0089_SW317_201214	Normal	EP2013989	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	15 Mar 2021	0089_SW317_210315	Normal	EP2102758	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	10 Jun 2021	0089_SW317_210610	Normal	EP2106582	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	31 Aug 2021	0089_SW317_210831	Normal	EP2110068	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	13 Jan 2022	0089_SW317_220113	Normal	EP2200343	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	16 Mar 2022	0089_SW317_220316	Normal	EP2203058	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	09 Jun 2022	0089_SW317_220609	Normal	EP2207029	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	06 Sep 2022	0089_SW317_220906	Normal	EP2211391	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	13 Dec 2022	0089_SW317_221213	Normal	EP2216934	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	14 Mar 2023	0089_SW317_230314	Normal	EP2303179	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	06 Jun 2023	0089_SW317_230606	Normal	EP2307434	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	04 Sep 2023	0089_QC101_230904	Field Duplicate	EP2312228	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW317	04 Sep 2023	0089_QC201_230904	Interlab Duplicate	1023399	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW317	04 Sep 2023	0089_SW317_230904	Normal	EP2312228	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Dredge spoil and Careening Bay	SW318	18 Apr 2018	0089_SW318_180418	Normal	209573	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	SW318	08 Jan 2020	0089_SW318_200108	Normal	EP2000183	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	30 Mar 2020	0089_QC103_200330	Field Duplicate	EP2003314	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	30 Mar 2020	0089_QC203_200330	Interlab Duplicate	711144	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW318	30 Mar 2020	0089_SW318_200330	Normal	EP2003314	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	21 Jul 2020	0089_SW318_200721	Normal	EP2007604	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	21 Sep 2020	0089_SW318_200921	Normal	EP2010083	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	14 Dec 2020	0089_SW318_201214	Normal	EP2013989	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	15 Mar 2021	0089_SW318_210315	Normal	EP2102758	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	10 Jun 2021	0089_SW318_210610	Normal	EP2106582	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	31 Aug 2021	0089_SW318_210831	Normal	EP2110068	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	13 Jan 2022	0089_SW318_220113	Normal	EP2200343	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	16 Mar 2022	0089_SW318_220316	Normal	EP2203058	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	09 Jun 2022	0089_SW318_220609	Normal	EP2207029	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	06 Sep 2022	0089_SW318_220906	Normal	EP2211391	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	13 Dec 2022	0089_SW318_221213	Normal	EP2216934	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	14 Mar 2023	0089_SW318_230314	Normal	EP2303179	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	06 Jun 2023	0089_SW318_230606	Normal	EP2307434	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW318	04 Sep 2023	0089_SW318_230904	Normal	EP2312228	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	18 Apr 2018	0089_SW319_180418	Normal	209573	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	SW319	08 Jan 2020	0089_SW319_200108	Normal	EP2000183	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	30 Mar 2020	0089_QC104_200330	Field Duplicate	EP2003314	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	30 Mar 2020	0089_QC204_200330	Interlab Duplicate	711144	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW319	30 Mar 2020	0089_SW319_200330	Normal	EP2003314	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	21 Jul 2020	0089_SW319_200721	Normal	EP2007604	<0.02	<0.02	0.03	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	21 Sep 2020	0089_QC104_200921	Field Duplicate	EP2010083	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	21 Sep 2020	0089_QC204_200921	Interlab Duplicate	746269	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW319	21 Sep 2020	0089_SW319_200921	Normal	EP2010083	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	14 Dec 2020	0089_QC111_201214	Field Duplicate	EP2013989	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

Table 3 - Surface water Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Freshwater 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
Dredge spoil and Careening Bay	SW319	14 Dec 2020	0089_QC211_201114	Interlab Duplicate	765054	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW319	14 Dec 2020	0089_SW319_201214	Normal	EP2013989	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	15 Mar 2021	0089_QC107_210315	Field Duplicate	EP2102758	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	15 Mar 2021	0089_QC207_210315	Interlab Duplicate	781350	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW319	15 Mar 2021	0089_SW319_210315	Normal	EP2102758	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	10 Jun 2021	0089_SW319_210610	Normal	EP2106582	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	31 Aug 2021	0089_SW319_210831	Normal	EP2110068	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	13 Jan 2022	0089_SW319_220113	Normal	EP2200343	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	16 Mar 2022	0089_SW319_220316	Normal	EP2203058	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	09 Jun 2022	0089_SW319_220609	Normal	EP2207029	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	06 Sep 2022	0089_SW319_220906	Normal	EP2211391	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	13 Dec 2022	0089_SW319_221213	Normal	EP2216934	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	14 Mar 2023	0089_SW319_230314	Normal	EP2303179	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	06 Jun 2023	0089_QC105_230606	Field Duplicate	EP2307434	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	06 Jun 2023	0089_QC205_230606	Interlab Duplicate	997465	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW319	06 Jun 2023	0089_SW319_230606	Normal	EP2307434	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	SW319	04 Sep 2023	0089_SW319_230904	Normal	EP2312228	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	19 Apr 2018	0089_SW353_180419	Normal	209623	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
WWTP	SW353	30 Jan 2020	0089_SW353_200130	Normal	EP2001004	<0.02	<0.02	<0.02	<0.02	0.52	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	02 Apr 2020	0089_SW353_200402	Normal	EP2003473	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	21 Jul 2020	0089_SW353_200721	Normal	EP2007595	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	23 Sep 2020	0089_SW353_200923	Normal	EP2010222	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	16 Dec 2020	0089_SW353_201216	Normal	EP2014090	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	17 Mar 2021	0089_SW353_210317	Normal	EP2102901	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	08 Jun 2021	0089_SW353_210608	Normal	EP2106450	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	30 Aug 2021	0089_SW353_210830	Normal	EP2110017	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	11 Jan 2022	0089_SW353_220111	Normal	EP2200240	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	14 Mar 2022	0089_SW353_220314	Normal	EP2202980	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	07 Jun 2022	0089_SW353_220607	Normal	EP2206884	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	07 Sep 2022	0089_SW353_220907	Normal	EP2211496	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	12 Dec 2022	0089_SW353_221212	Normal	EP2216877	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	15 Mar 2023	0089_SW353_230315	Normal	EP2303229	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	07 Jun 2023	0089_SW353_230607	Normal	EP2307493	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW353	05 Sep 2023	0089_SW353_230905	Normal	EP2312188	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	17 Apr 2018	0089_SW370_180417	Normal	209522	<0.001	<0.001	0.003	<0.001	0.008	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
WWTP	SW370	09 Jan 2020	0089_SW370_200109	Normal	EP2000249	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	31 Mar 2020	0089_SW370_200331	Normal	EP2003372	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	15 Jul 2020	0089_SW370_200715	Normal	EP2007383	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	24 Sep 2020	0089_SW370_200924	Normal	EP2010274	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	15 Dec 2020	0089_SW370_201215	Normal	EP2014053	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	16 Mar 2021	0089_SW370_210316	Normal	EP2102834	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	09 Jun 2021	0089_SW370_210609	Normal	EP2106517	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	01 Sep 2021	0089_SW370_210901	Normal	EP2110154	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	10 Jan 2022	0089_SW370_220110	Normal	EP2200215	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	14 Mar 2022	0089_SW370_220314	Normal	EP2202977	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	07 Jun 2022	0089_SW370_220607	Normal	EP2206884	<0.02	<0.02	0.02	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	05 Sep 2022	0089_SW370_220905	Normal	EP2211341	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	12 Dec 2022	0089_SW370_221212	Normal	EP2216877	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	14 Mar 2023	0089_SW370_230314	Normal	EP2303175	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	07 Jun 2023	0089_QC112_230607	Field Duplicate	EP2307493	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	07 Jun 2023	0089_QC212_230607	Interlab Duplicate	997465	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP	SW370	07 Jun 2023	0089_SW370_230607	Normal	EP2307493	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW370	05 Sep 2023	0089_SW370_230905	Normal	EP2312172	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	17 Apr 2018	0089_SW371_180417	Normal	209522	<0.001	<0.001	0.003	<0.001	0.009	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
WWTP	SW371	08 Jan 2020	0089_SW371_200108	Normal	EP2000183	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	01 Apr 2020	0089_SW371_200401	Normal	EP2003414	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	20 Jul 2020	0089_SW371_200720	Normal	EP2007545	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	22 Sep 2020	0089_SW371_200922	Normal	EP2010145	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	15 Dec 2020	0089_SW371_201215	Normal	EP2014048	<0.02	<0.02	<0.02	<0.02	0.31	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	15 Mar 2021	0089_QC103_210315	Field Duplicate	EP2102758	<0.02	<0.02	0.02	<0.02	0.24	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	15 Mar 2021	0089_QC203_210315	Interlab Duplicate	781350	<0.01	<0.01	0.02	<0.01	0.10	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP	SW371	15 Mar 2021	0089_SW371_210315	Normal	EP2102758	<0.02	<0.02	0.02	<0.02	0.22	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	10 Jun 2021	0089_SW371_210610	Normal	EP2106590	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	01 Sep 2021	0089_SW371_210901	Normal	EP2110154	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	11 Jan 2022	0089_SW371_220111	Normal	EP2200240	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	18 Mar 2022	0089_SW371_220318	Normal	EP2203195	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	08 Jun 2022	0089_SW371_220608	Normal	EP2206973	<0.02	<0.02	0.02	<0.02	0.18	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	05 Sep 2022	0089_SW371_220905	Normal	EP2211344	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	12 Dec 2022	0089_SW371_221212	Normal	EP2216879	<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	13 Mar 2023	0089_SW371_230313	Normal	EP2303086	<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	07 Jun 2023	0089_SW371_230607	Normal	EP2307502	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW371	05 Sep 2023	0089_SW371_230905	Normal	EP2312178	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	13 Apr 2018	0089_SW372_180413	Normal	209417	0.002	0.003	0.017	0.002	0.042	<0.002	<0.002	<0.002	0.006	<0.001	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
WWTP	SW372	08 Jan 2020	0089_SW372_200108	Normal	EP2000183	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	31 Mar 2020	0089_SW372_200331	Normal	EP2003372	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	20 Jul 2020	0089_SW372_200720	Normal	EP2007545	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	22 Sep 2020	0089_SW372_200922	Normal	EP2010145	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	15 Dec 2020	0089_SW372_201215	Normal	EP2014044	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	17 Mar 2021	0089_SW372_210317	Normal	EP2102901	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	10 Jun 2021	0089_SW372_210610	Normal	EP2106590	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	01 Sep 2021	0089_SW372_210901	Normal	EP2110154	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	12 Jan 2022	0089_QC116_220112	Field Duplicate	EP2200289	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	12 Jan 2022	0089_QC216_220112	Interlab Duplicate	855202	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP	SW372	12 Jan 2022	0089_SW372_220112	Normal	EP2200289	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	18 Mar 2022	0089_SW372_220318	Normal	EP2203195	<0.02	<0.02	0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	08 Jun 2022	0089_SW372_220608	Normal	EP2206973	<0.02	<0.02	0.02	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	06 Sep 2022	0089_SW372_220906	Normal	EP2211391	<0.02	<0.02	0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	12 Dec 2022	0089_SW372_221212	Normal	EP2216879	<0.02	<0.02	0.08	<0.02	0.60	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	14 Mar 2023	0089_SW372_230314	Normal	EP2303179	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	07 Jun 2023	0089_SW372_230607	Normal	EP2307502	<0.02	<0.02	<0.01	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW372	05 Sep 2023	0089_SW372_230905	Normal	EP2312178	<0.02	<0.02	0.04	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW373	13 Apr 2018	0089_SW373_180413	Normal	209417	0.002	0.002	0.020	0.002	0.042	<0.002	<0.002	<0.002	0.005	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
WWTP	SW373	08 Jan 2020	0089_SW373_200108	Normal	EP2000183	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW373	31 Mar 2020	0089_SW373_200331	Normal	EP2003372	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW373	20 Jul 2020	0089_SW373_200720	Normal	EP2007545	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW373	22 Sep 2020	0089_SW373_200922	Normal	EP2010145	<0.02	<0.02	0.12	<0.02	0.44	<0.02	<0.1	<0.02	0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW373	15 Dec 2020	0089_SW373_201215	Normal	EP2014044	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW373	17 Mar 2021	0089_SW373_210317	Normal	EP2102901	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW373	10 Jun 2021	0089_SW373_210610	Normal	EP2106579	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	SW373	30 Aug 2021	0089_SW373_210830	Normal	EP2110017	<0.02	<0.02	0.03	<0.02	0.37	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

Table 3 - Surface water Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Freshwater 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
WWTP	**SW373**	**12 Jan 2022**	**0089_SW373_220112**	**Normal**	**EP2200289**	<0.02	<0.02	0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW373**	**18 Mar 2022**	**0089_SW373_220318**	**Normal**	**EP2203195**	<0.02	<0.02	0.02	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW373**	**08 Jun 2022**	**0089_SW373_220608**	**Normal**	**EP2206973**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW373**	**06 Sep 2022**	**0089_SW373_220906**	**Normal**	**EP2211391**	<0.02	<0.02	0.01	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW373**	**12 Dec 2022**	**0089_SW373_221212**	**Normal**	**EP2216879**	<0.02	<0.02	0.04	<0.02	0.22	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW373**	**14 Mar 2023**	**0089_QC116_230314**	**Field Duplicate**	**EP2303179**	<0.02	<0.02	0.02	<0.02	0.13	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW373**	**14 Mar 2023**	**0089_QC216_230314**	**Interlab Duplicate**	**972487**	<0.01	<0.01	0.02	<0.01	0.14	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP	**SW373**	**14 Mar 2023**	**0089_SW373_230314**	**Normal**	**EP2303179**	<0.02	<0.02	0.02	<0.02	0.13	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW373**	**07 Jun 2023**	**0089_SW373_230607**	**Normal**	**EP2307502**	<0.02	<0.02	0.02	<0.02	0.28	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW373**	**05 Sep 2023**	**0089_SW373_230905**	**Normal**	**EP2312178**	<0.02	<0.02	0.01	<0.02	0.20	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**19 Apr 2018**	**0089_SW382_180419**	**Normal**	**209623**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
WWTP	**SW382**	**30 Jan 2020**	**0089_SW382_200130**	**Normal**	**EP2001004**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**02 Apr 2020**	**0089_SW382_200402**	**Normal**	**EP2003473**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**21 Jul 2020**	**0089_SW382_200721**	**Normal**	**EP2007595**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**23 Sep 2020**	**0089_SW382_200923**	**Normal**	**EP2010218**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**16 Dec 2020**	**0089_SW382_201216**	**Normal**	**EP2014104**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**17 Mar 2021**	**0089_SW382_210317**	**Normal**	**EP2102892**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**08 Jun 2021**	**0089_SW382_210608**	**Normal**	**EP2106450**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**30 Aug 2021**	**0089_SW382_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	0.17	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**11 Jan 2022**	**0089_SW382_220111**	**Normal**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**14 Mar 2022**	**0089_SW382_220314**	**Normal**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**07 Jun 2022**	**0089_SW382_220607**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**07 Sep 2022**	**0089_SW382_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**12 Dec 2022**	**0089_SW382_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**15 Mar 2023**	**0089_SW382_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**07 Jun 2023**	**0089_SW382_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW382**	**05 Sep 2023**	**0089_SW382_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**19 Apr 2018**	**0089_SW383_180419**	**Normal**	**209623**	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
WWTP	**SW383**	**30 Jan 2020**	**0089_SW383_200130**	**Normal**	**EP2001004**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**02 Apr 2020**	**0089_SW383_200402**	**Normal**	**EP2003473**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**21 Jul 2020**	**0089_SW383_200721**	**Normal**	**EP2007595**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**23 Sep 2020**	**0089_SW383_200923**	**Normal**	**EP2010222**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**16 Dec 2020**	**0089_SW383_201216**	**Normal**	**EP2014090**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**17 Mar 2021**	**0089_SW383_210317**	**Normal**	**EP2102892**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**08 Jun 2021**	**0089_SW383_210608**	**Normal**	**EP2106450**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**30 Aug 2021**	**0089_SW383_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**11 Jan 2022**	**0089_SW383_220111**	**Normal**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**07 Jun 2022**	**0089_SW383_220607**	**Normal**	**EP2206884**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**07 Sep 2022**	**0089_SW383_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**12 Dec 2022**	**0089_SW383_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**15 Mar 2023**	**0089_SW383_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW383**	**05 Sep 2023**	**0089_SW383_230905**	**Normal**	**EP2312188**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**19 Apr 2018**	**0089_SW384_180419**	**Normal**	**209623**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
WWTP	**SW384**	**30 Jan 2020**	**0089_SW384_200130**	**Normal**	**EP2001004**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**02 Apr 2020**	**0089_SW384_200402**	**Normal**	**EP2003473**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**21 Jul 2020**	**0089_SW384_200721**	**Normal**	**EP2007595**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**23 Sep 2020**	**0089_SW384_200923**	**Normal**	**EP2010222**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**16 Dec 2020**	**0089_SW384_201216**	**Normal**	**EP2014090**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**17 Mar 2021**	**0089_SW384_210317**	**Normal**	**EP2102901**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**08 Jun 2021**	**0089_SW384_210608**	**Normal**	**EP2106450**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**30 Aug 2021**	**0089_SW384_210830**	**Normal**	**EP2110017**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**11 Jan 2022**	**0089_SW384_220111**	**Normal**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**14 Mar 2022**	**0089_SW384_220314**	**Normal**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**07 Jun 2022**	**0089_SW384_220607**	**Normal**	**EP2206884**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**07 Sep 2022**	**0089_SW384_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**12 Dec 2022**	**0089_SW384_221212**	**Normal**	**EP2216873**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**15 Mar 2023**	**0089_SW384_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**07 Jun 2023**	**0089_SW384_230607**	**Normal**	**EP2307493**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**SW384**	**05 Sep 2023**	**0089_SW384_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**14 Jan 2020**	**0089_SW406_200114**	**Normal**	**EP2000422**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**01 Apr 2020**	**0089_SW406_200401**	**Normal**	**EP2003420**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**22 Jul 2020**	**0089_QC113_200722**	**Field Duplicate**	**EP2007649**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**22 Jul 2020**	**0089_QC213_200722**	**Interlab Duplicate**	**734409**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	**SW406**	**22 Jul 2020**	**0089_SW406_200722**	**Normal**	**EP2007649**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**21 Sep 2020**	**0089_QC111_200921**	**Field Duplicate**	**EP2010083**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**21 Sep 2020**	**0089_QC211_200921**	**Interlab Duplicate**	**746269**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	**SW406**	**21 Sep 2020**	**0089_SW406_200921**	**Normal**	**EP2010083**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**15 Dec 2020**	**0089_SW406_201215**	**Normal**	**EP2014048**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**15 Mar 2021**	**0089_SW406_210315**	**Normal**	**EP2102756**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**10 Jun 2021**	**0089_SW406_210610**	**Normal**	**EP2106590**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**31 Aug 2021**	**0089_SW406_210831**	**Normal**	**EP2110065**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	0.08	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**14 Jan 2022**	**0089_SW406_220114**	**Normal**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**16 Mar 2022**	**0089_SW406_220316**	**Normal**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**07 Jun 2022**	**0089_SW406_220607**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**07 Sep 2022**	**0089_SW406_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**13 Dec 2022**	**0089_SW406_221213**	**Normal**	**EP2216969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**14 Mar 2023**	**0089_SW406_230314**	**Normal**	**EP2303179**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**08 Jun 2023**	**0089_SW406_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	0.04	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW406**	**05 Sep 2023**	**0089_SW406_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**14 Jan 2020**	**0089_SW408_200114**	**Normal**	**EP2000422**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**01 Apr 2020**	**0089_SW408_200401**	**Normal**	**EP2003420**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**22 Jul 2020**	**0089_SW408_200722**	**Normal**	**EP2007649**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**21 Sep 2020**	**0089_SW408_200921**	**Normal**	**EP2010083**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**15 Dec 2020**	**0089_SW408_201215**	**Normal**	**EP2014053**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**15 Mar 2021**	**0089_SW408_210315**	**Normal**	**EP2102756**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**10 Jun 2021**	**0089_SW408_210610**	**Normal**	**EP2106590**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**31 Aug 2021**	**0089_SW408_210831**	**Normal**	**EP2110072**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	0.03	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**14 Jan 2022**	**0089_SW408_220114**	**Normal**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**16 Mar 2022**	**0089_SW408_220316**	**Normal**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**07 Jun 2022**	**0089_SW408_220607**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**07 Sep 2022**	**0089_SW408_220907**	**Normal**	**EP2211498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**13 Dec 2022**	**0089_SW408_221213**	**Normal**	**EP2216969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**14 Mar 2023**	**0089_SW408_230314**	**Normal**	**EP2303179**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**08 Jun 2023**	**0089_SW408_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	0.04	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW408**	**05 Sep 2023**	**0089_SW408_230905**	**Normal**	**EP2312184**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**14 Jan 2020**	**0089_SW410_200114**	**Normal**	**EP2000422**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**02 Apr 2020**	**0089_SW410_200402**	**Normal**	**EP2003471**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**21 Jul 2020**	**0089_SW410_200721**	**Normal**	**EP2007604**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.

Table 3 - Surface water Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Freshwater 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
HSF	**SW410**	**17 Mar 2021**	**0089_SW410_210317**	**Normal**	**EP2102901**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**10 Jun 2021**	**0089_QC114_210610**	**Field Duplicate**	**EP2106590**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**10 Jun 2021**	**0089_QC214_210610**	**Interlab Duplicate**	**802734**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	**SW410**	**10 Jun 2021**	**0089_SW410_210610**	**Normal**	**EP2106590**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**31 Aug 2021**	**0089_SW410_210831**	**Normal**	**EP2110065**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**14 Jan 2022**	**0089_SW410_220114**	**Normal**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**16 Mar 2022**	**0089_SW410_220316**	**Normal**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**07 Jun 2022**	**0089_SW410_220607**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**06 Sep 2022**	**0089_SW410_220906**	**Normal**	**EP2211391**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**13 Dec 2022**	**0089_SW410_221213**	**Normal**	**EP2216934**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**14 Mar 2023**	**0089_SW410_230314**	**Normal**	**EP2303179**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**08 Jun 2023**	**0089_SW410_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**04 Sep 2023**	**0089_QC107_230904**	**Field Duplicate**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW410**	**04 Sep 2023**	**0089_QC207_230904**	**Interlab Duplicate**	**1023399**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	**SW410**	**04 Sep 2023**	**0089_SW410_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**14 Jan 2020**	**0089_SW412_200114**	**Normal**	**EP2000422**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**01 Apr 2020**	**0089_SW412_200401**	**Normal**	**EP2003418**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**21 Jul 2020**	**0089_SW412_200721**	**Normal**	**EP2007604**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**22 Sep 2020**	**0089_SW412_200922**	**Normal**	**EP2010145**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**15 Dec 2020**	**0089_SW412_201215**	**Normal**	**EP2014044**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**18 Mar 2021**	**0089_SW412_210318**	**Normal**	**EP2102956**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**09 Jun 2021**	**0089_SW412_210609**	**Normal**	**EP2106517**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**01 Sep 2021**	**0089_SW412_210901**	**Normal**	**EP2110155**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**14 Jan 2022**	**0089_SW412_220114**	**Normal**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**16 Mar 2022**	**0089_SW412_220316**	**Normal**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**07 Jun 2022**	**0089_SW412_220607**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**06 Sep 2022**	**0089_SW412_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**14 Dec 2022**	**0089_SW412_221214**	**Normal**	**EP2216973**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**15 Mar 2023**	**0089_SW412_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**08 Jun 2023**	**0089_SW412_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**04 Sep 2023**	**0089_QC109_230904**	**Field Duplicate**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW412**	**04 Sep 2023**	**0089_QC209_230904**	**Interlab Duplicate**	**1023399**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	**SW412**	**04 Sep 2023**	**0089_SW412_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**14 Jan 2020**	**0089_SW414_200114**	**Normal**	**EP2000422**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**02 Apr 2020**	**0089_SW414_200402**	**Normal**	**EP2003473**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**21 Jul 2020**	**0089_SW414_200721**	**Normal**	**EP2007604**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**22 Sep 2020**	**0089_SW414_200922**	**Normal**	**EP2010145**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**15 Dec 2020**	**0089_SW414_201215**	**Normal**	**EP2014044**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**18 Mar 2021**	**0089_SW414_210318**	**Normal**	**EP2102941**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**09 Jun 2021**	**0089_SW414_210609**	**Normal**	**EP2106517**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**01 Sep 2021**	**0089_SW414_210901**	**Normal**	**EP2110155**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**14 Jan 2022**	**0089_SW414_220114**	**Normal**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**16 Mar 2022**	**0089_SW414_220316**	**Normal**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**07 Jun 2022**	**0089_QC116_220607**	**Field Duplicate**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**07 Jun 2022**	**0089_QC216_220607**	**Interlab Duplicate**	**896805**	<0.002	<0.002	<0.002	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
HSF	**SW414**	**07 Jun 2022**	**0089_SW414_220607**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**06 Sep 2022**	**0089_SW414_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**14 Dec 2022**	**0089_SW414_221214**	**Normal**	**EP2216973**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**15 Mar 2023**	**0089_SW414_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**08 Jun 2023**	**0089_SW414_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW414**	**04 Sep 2023**	**0089_SW414_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**14 Jan 2020**	**0089_SW416_200114**	**Normal**	**EP2000422**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**02 Apr 2020**	**0089_SW416_200402**	**Normal**	**EP2003473**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**21 Jul 2020**	**0089_SW416_200721**	**Normal**	**EP2007604**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**22 Sep 2020**	**0089_SW416_200922**	**Normal**	**EP2010145**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**15 Dec 2020**	**0089_SW416_201215**	**Normal**	**EP2014044**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**18 Mar 2021**	**0089_SW416_210318**	**Normal**	**EP2102941**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**09 Jun 2021**	**0089_SW416_210609**	**Normal**	**EP2106517**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**01 Sep 2021**	**0089_SW416_210901**	**Normal**	**EP2110155**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**14 Jan 2022**	**0089_SW416_220114**	**Normal**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**16 Mar 2022**	**0089_SW416_220316**	**Normal**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**07 Jun 2022**	**0089_SW416_220607**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**06 Sep 2022**	**0089_SW416_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**14 Dec 2022**	**0089_SW416_221214**	**Normal**	**EP2216973**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**15 Mar 2023**	**0089_SW416_230315**	**Normal**	**EP2303229**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**08 Jun 2023**	**0089_SW416_230608**	**Normal**	**EP2307592**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
HSF	**SW416**	**04 Sep 2023**	**0089_SW416_230904**	**Normal**	**EP2312228**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Freshwater 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.002	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Freshwater 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
FTA	**SW130**	**17 Jul 2017**	**0089_SW130_170717**	**Normal**	**198331**	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
FTA	**SW130**	**08 Jan 2020**	**0089_SW130_200108**	**Normal**	**EP2000180**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW130**	**30 Mar 2020**	**0089_SW130_200330**	**Normal**	**EP2003316**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW130**	**15 Jul 2020**	**0089_SW130_200715**	**Normal**	**EP2007383**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
FTA	**SW130**	**22 Sep 2020**	**0089_SW130_200922**	**Normal**	**EP2010153**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW130**	**14 Dec 2020**	**0089_SW130_201214**	**Normal**	**EP2013985**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.09	0.09
FTA	**SW130**	**15 Mar 2021**	**0089_SW130_210315**	**Normal**	**EP2102756**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
FTA	**SW130**	**08 Jun 2021**	**0089_SW130_210608**	**Normal**	**EP2106465**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
FTA	**SW130**	**30 Aug 2021**	**0089_SW130_210830**	**Normal**	**EP2110021**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW130**	**10 Jan 2022**	**0089_SW130_220110**	**Normal**	**EP2200215**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
FTA	**SW130**	**14 Mar 2022**	**0089_SW130_220314**	**Normal**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW130**	**07 Jun 2022**	**0089_SW130_220607**	**Normal**	**EP2206881**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW130**	**05 Sep 2022**	**0089_SW130_220905**	**Normal**	**EP2211344**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW130**	**12 Dec 2022**	**0089_SW130_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
FTA	**SW130**	**13 Mar 2023**	**0089_QC102_230313**	**Field Duplicate**	**EP2303086**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.05	0.05
FTA	**SW130**	**13 Mar 2023**	**0089_QC202_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
FTA	**SW130**	**13 Mar 2023**	**0089_SW130_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.03	0.03
FTA	**SW130**	**07 Jun 2023**	**0089_SW130_230607**	**Normal**	**EP2307502**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW130**	**05 Sep 2023**	**0089_SW130_230905**	**Normal**	**EP2312188**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW132**	**17 Jul 2017**	**0089_QC1SW_170717**	**Field Duplicate**	**198331**	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
FTA	**SW132**	**17 Jul 2017**	**0089_QC2SW_170717**	**Interlab Duplicate**	**555139**	<0.01	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			
FTA	**SW132**	**17 Jul 2017**	**0089_SW132_170717**	**Normal**	**198331**	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
FTA	**SW132**	**08 Jan 2020**	**0089_SW132_200108**	**Normal**	**EP2000180**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW132**	**30 Mar 2020**	**0089_SW132_200330**	**Normal**	**EP2003316**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW132**	**15 Jul 2020**	**0089_QC103_200715**	**Field Duplicate**	**EP2007383**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
FTA	**SW132**	**15 Jul 2020**	**0089_QC203_200215**	**Interlab Duplicate**	**732844**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
FTA	**SW132**	**15 Jul 2020**	**0089_SW132_200715**	**Normal**	**EP2007383**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
FTA	**SW132**	**22 Sep 2020**	**0089_SW132_200922**	**Normal**	**EP2010153**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
FTA	**SW132**	**14 Dec 2020**	**0089_QC107_201214**	**Field Duplicate**	**EP2013988**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW132**	**14 Dec 2020**	**0089_QC207_201114**	**Interlab Duplicate**	**765054**	<0.01	0.09	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	0.09	<0.1
FTA	**SW132**	**14 Dec 2020**	**0089_SW132_201214**	**Normal**	**EP2013988**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW132**	**15 Mar 2021**	**0089_SW132_210315**	**Normal**	**EP2102756**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
FTA	**SW132**	**08 Jun 2021**	**0089_SW132_210608**	**Normal**	**EP2106465**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
FTA	**SW132**	**30 Aug 2021**	**0089_SW132_210830**	**Normal**	**EP2110021**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW132**	**10 Jan 2022**	**0089_SW132_220110**	**Normal**	**EP2200215**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
FTA	**SW132**	**14 Mar 2022**	**0089_SW132_220314**	**Normal**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW132**	**07 Jun 2022**	**0089_SW132_220607**	**Normal**	**EP2206881**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW132**	**05 Sep 2022**	**0089_QC104_220905**	**Field Duplicate**	**EP2211344**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW132**	**05 Sep 2022**	**0089_QC204_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
FTA	**SW132**	**05 Sep 2022**	**0089_SW132_220905**	**Normal**	**EP2211344**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW132**	**12 Dec 2022**	**0089_QC104_221212**	**Field Duplicate**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
FTA	**SW132**	**12 Dec 2022**	**0089_QC204_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1
FTA	**SW132**	**12 Dec 2022**	**0089_SW132_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
FTA	**SW132**	**13 Mar 2023**	**0089_SW132_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.02	0.02
FTA	**SW132**	**07 Jun 2023**	**0089_SW132_230607**	**Normal**	**EP2307502**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW132**	**05 Sep 2023**	**0089_SW132_230905**	**Normal**	**EP2312188**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**17 Jul 2017**	**0089_SW134_170717**	**Normal**	**198331**	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
FTA	**SW134**	**08 Jan 2020**	**0089_QC109_200108**	**Field Duplicate**	**EP2000180**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**08 Jan 2020**	**0089_QC209_200108**	**Interlab Duplicate**	**696100**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
FTA	**SW134**	**08 Jan 2020**	**0089_SW134_200108**	**Normal**	**EP2000180**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**31 Mar 2020**	**0089_QC101_200331**	**Field Duplicate**	**EP2003367**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**31 Mar 2020**	**0089_QC201_200331**	**Interlab Duplicate**	**711434**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
FTA	**SW134**	**31 Mar 2020**	**0089_SW134_200331**	**Normal**	**EP2003367**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**15 Jul 2020**	**0089_SW134_200715**	**Normal**	**EP2007383**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**22 Sep 2020**	**0089_QC116_200922**	**Field Duplicate**	**EP2010153**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
FTA	**SW134**	**22 Sep 2020**	**0089_QC216_200921**	**Interlab Duplicate**	**746269**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
FTA	**SW134**	**22 Sep 2020**	**0089_SW134_200922**	**Normal**	**EP2010153**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
FTA	**SW134**	**14 Dec 2020**	**0089_SW134_201214**	**Normal**	**EP2013988**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**15 Mar 2021**	**0089_SW134_210315**	**Normal**	**EP2102756**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
FTA	**SW134**	**08 Jun 2021**	**0089_QC110_210608**	**Field Duplicate**	**EP2106450**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**08 Jun 2021**	**0089_QC210_210608**	**Interlab Duplicate**	**802464**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.01	<0.05	<0.1
FTA	**SW134**	**08 Jun 2021**	**0089_SW134_210608**	**Normal**	**EP2106450**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**30 Aug 2021**	**0089_QC104_210830**	**Field Duplicate**	**EP2110021**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**30 Aug 2021**	**0089_QC204_210830**	**Interlab Duplicate**	**820919**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
FTA	**SW134**	**30 Aug 2021**	**0089_SW134_210830**	**Normal**	**EP2110021**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**10 Jan 2022**	**0089_QC102_220110**	**Field Duplicate**	**EP2200212**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
FTA	**SW134**	**10 Jan 2022**	**0089_QC202_220110**	**Interlab Duplicate**	**854607**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.03	<0.05	<0.1
FTA	**SW134**	**10 Jan 2022**	**0089_SW134_220110**	**Normal**	**EP2200212**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
FTA	**SW134**	**14 Mar 2022**	**0089_QC107_220314**	**Field Duplicate**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**14 Mar 2022**	**0089_QC207_220314**	**Interlab Duplicate**	**872911**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
FTA	**SW134**	**14 Mar 2022**	**0089_SW134_220314**	**Normal**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**07 Jun 2022**	**0089_QC108_220607**	**Field Duplicate**	**EP2206881**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
FTA	**SW134**	**07 Jun 2022**	**0089_QC208_220607**	**Interlab Duplicate**	**896805**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.031	0.033	0.033
FTA	**SW134**	**07 Jun 2022**	**0089_SW134_220607**	**Normal**	**EP2206881**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
FTA	**SW134**	**05 Sep 2022**	**0089_SW134_220905**	**Normal**	**EP2211344**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**12 Dec 2022**	**0089_QC112_221212**	**Field Duplicate**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
FTA	**SW134**	**12 Dec 2022**	**0089_QC212_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.01	<0.05	<0.1
FTA	**SW134**	**12 Dec 2022**	**0089_SW134_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
FTA	**SW134**	**13 Mar 2023**	**0089_SW134_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**07 Jun 2023**	**0089_SW134_230607**	**Normal**	**EP2307502**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
FTA	**SW134**	**05 Sep 2023**	**0089_SW134_230905**	**Normal**	**EP2312188**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**24 Aug 2017**	**0089_SW150_170824**	**Normal**	**199846**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
Demolition Ground	**SW150**	**08 Jan 2020**	**0089_SW150_200108**	**Normal**	**EP2000180**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**30 Mar 2020**	**0089_SW150_200330**	**Normal**	**EP2003309**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**20 Jul 2020**	**0089_SW150_200720**	**Normal**	**EP2007545**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**23 Sep 2020**	**0089_SW150_200923**	**Normal**	**EP2010218**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**14 Dec 2020**	**0089_SW150_201214**	**Normal**	**EP2013973**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**16 Mar 2021**	**0089_SW150_210316**	**Normal**	**EP2102836**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**08 Jun 2021**	**0089_QC109_210608**	**Field Duplicate**	**EP2106465**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**08 Jun 2021**	**0089_QC209_210608**	**Interlab Duplicate**	**802464**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
Demolition Ground	**SW150**	**08 Jun 2021**	**0089_SW150_210608**	**Normal**	**EP2106465**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**30 Aug 2021**	**0089_QC108_210830**	**Field Duplicate**	**EP2110017**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**30 Aug 2021**	**0089_QC208_210830**	**Interlab Duplicate**	**820919**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
Demolition Ground	**SW150**	**30 Aug 2021**	**0089_SW150_210830**	**Normal**	**EP2110017**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**10 Jan 2022**	**0089_SW150_220110**	**Normal**	**EP2200218**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**15 Mar 2022**	**0089_QC117_220315**	**Field Duplicate**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**15 Mar 2022**	**0089_QC217_220315**	**Interlab Duplicate**	**872903**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
Demolition Ground	**SW150**	**15 Mar 2022**	**0089_SW150_220315**	**Normal**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01

Table 3 - Surface water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.002	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Freshwater 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
Demolition Ground	**SW150**	**08 Jun 2022**	**0089_SW150_220608**	**Normal**	**EP2206970**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**05 Sep 2022**	**0089_SW150_220905**	**Normal**	**EP2211347**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**12 Dec 2022**	**0089_SW150_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**15 Mar 2023**	**0089_SW150_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**07 Jun 2023**	**0089_QC115_230607**	**Field Duplicate**	**EP2307498**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**07 Jun 2023**	**0089_QC215_230607**	**Interlab Duplicate**	**997465**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
Demolition Ground	**SW150**	**07 Jun 2023**	**0089_SW150_230607**	**Normal**	**EP2307498**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**11 Sep 2023**	**0089_SW150_230911**	**Normal**	**EP2312525**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
Demolition Ground	**SW152**	**24 Aug 2017**	**0089_SW152_170824**	**Normal**	**199846**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
Demolition Ground	**SW152**	**08 Jan 2020**	**0089_SW152_200108**	**Normal**	**EP2000180**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**30 Mar 2020**	**0089_SW152_200330**	**Normal**	**EP2003309**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**20 Jul 2020**	**0089_SW152_200720**	**Normal**	**EP2007545**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**23 Sep 2020**	**0089_SW152_200923**	**Normal**	**EP2010218**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**14 Dec 2020**	**0089_SW152_201214**	**Normal**	**EP2013973**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**16 Mar 2021**	**0089_SW152_210316**	**Normal**	**EP2102836**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**08 Jun 2021**	**0089_SW152_210608**	**Normal**	**EP2106465**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**30 Aug 2021**	**0089_SW152_210830**	**Normal**	**EP2110017**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**10 Jan 2022**	**0089_SW152_220110**	**Normal**	**EP2200218**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**15 Mar 2022**	**0089_SW152_220315**	**Normal**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**08 Jun 2022**	**0089_SW152_220608**	**Normal**	**EP2206970**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**08 Jun 2022**	**0089_SW152_220608**	**Normal**	**EP2208241**														
Demolition Ground	**SW152**	**05 Sep 2022**	**0089_QC103_220905**	**Field Duplicate**	**EP2211347**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**05 Sep 2022**	**0089_QC203_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
Demolition Ground	**SW152**	**05 Sep 2022**	**0089_SW152_220905**	**Normal**	**EP2211347**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**12 Dec 2022**	**0089_SW152_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**15 Mar 2023**	**0089_SW152_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**07 Jun 2023**	**0089_SW152_230607**	**Normal**	**EP2307498**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW152**	**11 Sep 2023**	**0089_SW152_230911**	**Normal**	**EP2312525**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**24 Aug 2017**	**0089_SW154_170824**	**Normal**	**199846**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
Demolition Ground	**SW154**	**08 Jan 2020**	**0089_QC104_200108**	**Field Duplicate**	**EP2000180**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**08 Jan 2020**	**0089_QC204_200108**	**Interlab Duplicate**	**696100**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
Demolition Ground	**SW154**	**08 Jan 2020**	**0089_SW154_200108**	**Normal**	**EP2000180**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**30 Mar 2020**	**0089_SW154_200330**	**Normal**	**EP2003309**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**20 Jul 2020**	**0089_SW154_200720**	**Normal**	**EP2007545**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**22 Sep 2020**	**0089_SW154_200922**	**Normal**	**EP2010153**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**14 Dec 2020**	**0089_SW154_201214**	**Normal**	**EP2013989**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**16 Mar 2021**	**0089_SW154_210316**	**Normal**	**EP2102836**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**08 Jun 2021**	**0089_SW154_210608**	**Normal**	**EP2106465**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**30 Aug 2021**	**0089_SW154_210830**	**Normal**	**EP2110017**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**10 Jan 2022**	**0089_SW154_220110**	**Normal**	**EP2200218**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**15 Mar 2022**	**0089_QC113_220315**	**Field Duplicate**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**15 Mar 2022**	**0089_QC213_220315**	**Interlab Duplicate**	**872903**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
Demolition Ground	**SW154**	**15 Mar 2022**	**0089_SW154_220315**	**Normal**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**08 Jun 2022**	**0089_SW154_220608**	**Normal**	**EP2206970**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**05 Sep 2022**	**0089_SW154_220905**	**Normal**	**EP2211347**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**12 Dec 2022**	**0089_QC109_221212**	**Field Duplicate**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**12 Dec 2022**	**0089_QC209_221212**	**Interlab Duplicate**	**950091**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
Demolition Ground	**SW154**	**12 Dec 2022**	**0089_SW154_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**15 Mar 2023**	**0089_SW154_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**07 Jun 2023**	**0089_SW154_230607**	**Normal**	**EP2307498**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW154**	**11 Sep 2023**	**0089_SW154_230911**	**Normal**	**EP2312525**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**24 Aug 2017**	**0089_SW156_170824**	**Normal**	**199846**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
Demolition Ground	**SW156**	**08 Jan 2020**	**0089_SW156_200108**	**Normal**	**EP2000180**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**30 Mar 2020**	**0089_SW156_200330**	**Normal**	**EP2003309**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**20 Jul 2020**	**0089_SW156_200720**	**Normal**	**EP2007545**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**23 Sep 2020**	**0089_SW156_200923**	**Normal**	**EP2010218**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**14 Dec 2020**	**0089_SW156_201214**	**Normal**	**EP2013989**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**16 Mar 2021**	**0089_QC111_210316**	**Field Duplicate**	**EP2102836**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**16 Mar 2021**	**0089_QC211_210316**	**Interlab Duplicate**	**781350**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1
Demolition Ground	**SW156**	**16 Mar 2021**	**0089_SW156_210316**	**Normal**	**EP2102836**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**08 Jun 2021**	**0089_SW156_210608**	**Normal**	**EP2106465**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**30 Aug 2021**	**0089_SW156_210830**	**Normal**	**EP2110017**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**10 Jan 2022**	**0089_QC107_220110**	**Field Duplicate**	**EP2200218**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**10 Jan 2022**	**0089_QC207_220110**	**Interlab Duplicate**	**854607**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
Demolition Ground	**SW156**	**10 Jan 2022**	**0089_SW156_220110**	**Normal**	**EP2200218**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**15 Mar 2022**	**0089_SW156_220315**	**Normal**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**08 Jun 2022**	**0089_SW156_220608**	**Normal**	**EP2206970**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**05 Sep 2022**	**0089_SW156_220905**	**Normal**	**EP2211347**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**12 Dec 2022**	**0089_SW156_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**15 Mar 2023**	**0089_SW156_230315**	**Normal**	**EP2303227**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**07 Jun 2023**	**0089_SW156_230607**	**Normal**	**EP2307498**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**11 Sep 2023**	**0089_SW156_230911**	**Normal**	**EP2312525**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW305**	**17 Apr 2018**	**0089_SW305_180417**	**Normal**	**209522**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
WWTP	**SW305**	**08 Jan 2020**	**0089_SW305_200108**	**Normal**	**EP2000183**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
WWTP	**SW305**	**31 Mar 2020**	**0089_SW305_200331**	**Normal**	**EP2003372**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
WWTP	**SW305**	**20 Jul 2020**	**0089_SW305_200720**	**Normal**	**EP2007545**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
WWTP	**SW305**	**22 Sep 2020**	**0089_SW305_200922**	**Normal**	**EP2010145**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
WWTP	**SW305**	**15 Dec 2020**	**0089_SW305_201215**	**Normal**	**EP2014048**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.13*	0.13	0.13
WWTP	**SW305**	**15 Mar 2021**	**0089_SW305_210315**	**Normal**	**EP2102758**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.40*	0.40	0.40
WWTP	**SW305**	**10 Jun 2021**	**0089_SW305_210610**	**Normal**	**EP2106582**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW305**	**01 Sep 2021**	**0089_SW305_210901**	**Normal**	**EP2110154**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW305**	**11 Jan 2022**	**0089_SW305_220111**	**Normal**	**EP2200240**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
WWTP	**SW305**	**18 Mar 2022**	**0089_SW305_220318**	**Normal**	**EP2203195**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW305**	**08 Jun 2022**	**0089_SW305_220608**	**Normal**	**EP2206973**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.23*	0.23	0.23
WWTP	**SW305**	**05 Sep 2022**	**0089_QC115_220905**	**Field Duplicate**	**EP2211344**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW305**	**05 Sep 2022**	**0089_QC215_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
WWTP	**SW305**	**05 Sep 2022**	**0089_SW305_220905**	**Normal**	**EP2211344**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW305**	**12 Dec 2022**	**0089_SW305_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
WWTP	**SW305**	**13 Mar 2023**	**0089_QC114_230313**	**Field Duplicate**	**EP2303086**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
WWTP	**SW305**	**13 Mar 2023**	**0089_QC214_230313**	**Interlab Duplicate**	**972487**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.01	<0.05	<0.1
WWTP	**SW305**	**13 Mar 2023**	**0089_SW305_230313**	**Normal**	**EP2303086**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
WWTP	**SW305**	**07 Jun 2023**	**0089_SW305_230607**	**Normal**	**EP2307502**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
WWTP	**SW305**	**05 Sep 2023**	**0089_SW305_230905**	**Normal**	**EP2312178**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**18 Apr 2018**	**0089_SW309_180418**	**Normal**	**209573**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
HSF	**SW309**	**10 Jan 2020**	**0089_QC101_200110**	**Field Duplicate**	**EP2000292**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**10 Jan 2020**	**0089_QC201_200110**	**Interlab Duplicate**	**696578**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
HSF	**SW309**	**10 Jan 2020**	**0089_SW309_200110**	**Normal**	**EP2000292**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**31 Mar 2020**	**0089_SW309_200331**	**Normal**	**EP2003369**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**22 Jul 2020**	**0089_SW309_200722**	**Normal**	**EP2007649**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**23 Sep 2020**	**0089_SW309_200923**	**Normal**	**EP2010222**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01

Table 3 - Surface water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.002	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Freshwater 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
HSF	**SW309**	**15 Dec 2020**	**0089_QC112_201215**	**Field Duplicate**	**EP2014048**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**15 Dec 2020**	**0089_QC212_201115**	**Interlab Duplicate**	**765054**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
HSF	**SW309**	**15 Dec 2020**	**0089_SW309_201215**	**Normal**	**EP2014048**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**17 Mar 2021**	**0089_SW309_210317**	**Normal**	**EP2102892**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**09 Jun 2021**	**0089_SW309_210609**	**Normal**	**EP2106519**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**31 Aug 2021**	**0089_QC114_210831**	**Field Duplicate**	**EP2110065**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**31 Aug 2021**	**0089_QC214_210831**	**Interlab Duplicate**	**821197**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
HSF	**SW309**	**31 Aug 2021**	**0089_SW309_210831**	**Normal**	**EP2110065**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**13 Jan 2022**	**0089_SW309_220113**	**Normal**	**EP2200338**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**16 Mar 2022**	**0089_SW309_220316**	**Normal**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**07 Jun 2022**	**0089_SW309_220607**	**Normal**	**EP2206887**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**06 Sep 2022**	**0089_SW309_220906**	**Normal**	**EP2211401**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**13 Dec 2022**	**0089_SW309_221213**	**Normal**	**EP2217375**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**14 Mar 2023**	**0089_SW309_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**08 Jun 2023**	**0089_SW309_230608**	**Normal**	**EP2307590**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW309**	**04 Sep 2023**	**0089_SW309_230904**	**Normal**	**EP2312228**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**30 Apr 2018**	**0089_SW310_180430**	**Normal**	**209959**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
HSF	**SW310**	**10 Jan 2020**	**0089_SW310_200110**	**Normal**	**EP2000292**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**31 Mar 2020**	**0089_SW310_200331**	**Normal**	**EP2003369**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**22 Jul 2020**	**0089_SW310_200722**	**Normal**	**EP2007649**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**23 Sep 2020**	**0089_SW310_200923**	**Normal**	**EP2010222**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**15 Dec 2020**	**0089_SW310_201215**	**Normal**	**EP2014048**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**17 Mar 2021**	**0089_SW310_210317**	**Normal**	**EP2102890**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**09 Jun 2021**	**0089_SW310_210609**	**Normal**	**EP2106519**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**31 Aug 2021**	**0089_SW310_210831**	**Normal**	**EP2110065**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**13 Jan 2022**	**0089_SW310_220113**	**Normal**	**EP2200338**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**16 Mar 2022**	**0089_SW310_220316**	**Normal**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**07 Jun 2022**	**0089_QC103_220607**	**Field Duplicate**	**EP2206887**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**07 Jun 2022**	**0089_QC203_220607**	**Interlab Duplicate**	**896805**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.004	0.004	0.004
HSF	**SW310**	**07 Jun 2022**	**0089_SW310_220607**	**Normal**	**EP2206887**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**06 Sep 2022**	**0089_SW310_220906**	**Normal**	**EP2211401**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**13 Dec 2022**	**0089_SW310_221213**	**Normal**	**EP2216930**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**14 Mar 2023**	**0089_SW310_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**08 Jun 2023**	**0089_SW310_230608**	**Normal**	**EP2307590**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW310**	**04 Sep 2023**	**0089_SW310_230904**	**Normal**	**EP2312228**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**30 Apr 2018**	**0089_SW311_180430**	**Normal**	**209959**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
HSF	**SW311**	**01 Apr 2020**	**0089_SW311_200401**	**Normal**	**EP2003418**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**22 Jul 2020**	**0089_SW311_200722**	**Normal**	**EP2007649**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**23 Sep 2020**	**0089_SW311_200923**	**Normal**	**EP2010222**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**15 Dec 2020**	**0089_SW311_201215**	**Normal**	**EP2014053**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**17 Mar 2021**	**0089_SW311_210317**	**Normal**	**EP2102892**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**09 Jun 2021**	**0089_SW311_210609**	**Normal**	**EP2106519**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**31 Aug 2021**	**0089_SW311_210831**	**Normal**	**EP2110072**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**13 Jan 2022**	**0089_SW311_220113**	**Normal**	**EP2200338**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**16 Mar 2022**	**0089_SW311_220316**	**Normal**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**07 Jun 2022**	**0089_SW311_220607**	**Normal**	**EP2206887**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**06 Sep 2022**	**0089_SW311_220906**	**Normal**	**EP2211401**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**13 Dec 2022**	**0089_SW311_221213**	**Normal**	**EP2216930**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**14 Mar 2023**	**0089_SW311_230314**	**Normal**	**EP2303175**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**08 Jun 2023**	**0089_SW311_230608**	**Normal**	**EP2307590**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW311**	**04 Sep 2023**	**0089_SW311_230904**	**Normal**	**EP2312228**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Dredge spoil and Careening Bay	**SW317**	**17 Apr 2018**	**0089_SW317_180417**	**Normal**	**209522**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	SW317	**08 Jan 2020**	**0089_SW317_200108**	**Normal**	**EP2000183**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**10 Jan 2020**	**0089_SW317_200110**	**Normal**	**EP2000292**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**30 Mar 2020**	**0089_SW317_200330**	**Normal**	**EP2003314**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**21 Jul 2020**	**0089_SW317_200721**	**Normal**	**EP2007604**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
	SW317	**21 Sep 2020**	**0089_SW317_200921**	**Normal**	**EP2010083**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**14 Dec 2020**	**0089_SW317_201214**	**Normal**	**EP2013989**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**15 Mar 2021**	**0089_SW317_210315**	**Normal**	**EP2102758**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**10 Jun 2021**	**0089_SW317_210610**	**Normal**	**EP2106582**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**31 Aug 2021**	**0089_SW317_210831**	**Normal**	**EP2110068**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**13 Jan 2022**	**0089_SW317_220113**	**Normal**	**EP2200343**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**16 Mar 2022**	**0089_SW317_220316**	**Normal**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**09 Jun 2022**	**0089_SW317_220609**	**Normal**	**EP2207029**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**06 Sep 2022**	**0089_SW317_220906**	**Normal**	**EP2211391**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**13 Dec 2022**	**0089_SW317_221213**	**Normal**	**EP2216934**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**14 Mar 2023**	**0089_SW317_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**06 Jun 2023**	**0089_SW317_230606**	**Normal**	**EP2307434**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**04 Sep 2023**	**0089_QC101_230904**	**Field Duplicate**	**EP2312228**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW317	**04 Sep 2023**	**0089_QC201_230904**	**Interlab Duplicate**	**1023399**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	SW317	**04 Sep 2023**	**0089_SW317_230904**	**Normal**	**EP2312228**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Dredge spoil and Careening Bay	**SW318**	**18 Apr 2018**	**0089_SW318_180418**	**Normal**	**209573**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	SW318	**08 Jan 2020**	**0089_SW318_200108**	**Normal**	**EP2000183**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**30 Mar 2020**	**0089_QC103_200330**	**Field Duplicate**	**EP2003314**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
	SW318	**30 Mar 2020**	**0089_QC203_200330**	**Interlab Duplicate**	**711144**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1
	SW318	**30 Mar 2020**	**0089_SW318_200330**	**Normal**	**EP2003314**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**21 Jul 2020**	**0089_SW318_200721**	**Normal**	**EP2007604**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**21 Sep 2020**	**0089_SW318_200921**	**Normal**	**EP2010083**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**14 Dec 2020**	**0089_SW318_201214**	**Normal**	**EP2013989**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**15 Mar 2021**	**0089_SW318_210315**	**Normal**	**EP2102758**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**10 Jun 2021**	**0089_SW318_210610**	**Normal**	**EP2106582**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**31 Aug 2021**	**0089_SW318_210831**	**Normal**	**EP2110068**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**13 Jan 2022**	**0089_SW318_220113**	**Normal**	**EP2200343**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**16 Mar 2022**	**0089_SW318_220316**	**Normal**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**09 Jun 2022**	**0089_SW318_220609**	**Normal**	**EP2207029**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**06 Sep 2022**	**0089_SW318_220906**	**Normal**	**EP2211391**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**13 Dec 2022**	**0089_SW318_221213**	**Normal**	**EP2216934**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**14 Mar 2023**	**0089_SW318_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**06 Jun 2023**	**0089_SW318_230606**	**Normal**	**EP2307434**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW318	**04 Sep 2023**	**0089_SW318_230904**	**Normal**	**EP2312228**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	**18 Apr 2018**	**0089_SW319_180418**	**Normal**	**209573**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	SW319	**08 Jan 2020**	**0089_SW319_200108**	**Normal**	**EP2000183**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	**30 Mar 2020**	**0089_QC104_200330**	**Field Duplicate**	**EP2003314**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	**30 Mar 2020**	**0089_QC204_200330**	**Interlab Duplicate**	**711144**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	SW319	**30 Mar 2020**	**0089_SW319_200330**	**Normal**	**EP2003314**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	**21 Jul 2020**	**0089_SW319_200721**	**Normal**	**EP2007604**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.13*	0.13	0.13
	SW319	**21 Sep 2020**	**0089_QC104_200921**	**Field Duplicate**	**EP2010083**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	**21 Sep 2020**	**0089_QC204_200921**	**Interlab Duplicate**	**746269**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	SW319	**21 Sep 2020**	**0089_SW319_200921**	**Normal**	**EP2010083**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	**14 Dec 2020**	**0089_QC111_201214**	**Field Duplicate**	**EP2013989**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01

Table 3 - Surface water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.002	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Freshwater 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
Dredge spoil and Careening Bay	SW319	14 Dec 2020	0089_QC211_201114	Interlab Duplicate	765054	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	SW319	14 Dec 2020	0089_SW319_201214	Normal	EP2013989	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	15 Mar 2021	0089_QC107_210315	Field Duplicate	EP2102758	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	15 Mar 2021	0089_QC207_210315	Interlab Duplicate	781350	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	SW319	15 Mar 2021	0089_SW319_210315	Normal	EP2102758	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	10 Jun 2021	0089_SW319_210610	Normal	EP2106582	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	31 Aug 2021	0089_SW319_210831	Normal	EP2110068	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	13 Jan 2022	0089_SW319_220113	Normal	EP2200343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	16 Mar 2022	0089_SW319_220316	Normal	EP2203058	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	09 Jun 2022	0089_SW319_220609	Normal	EP2207029	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	06 Sep 2022	0089_SW319_220906	Normal	EP2211391	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	13 Dec 2022	0089_SW319_221213	Normal	EP2216934	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	14 Mar 2023	0089_SW319_230314	Normal	EP2303179	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	06 Jun 2023	0089_QC105_230606	Field Duplicate	EP2307434	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	06 Jun 2023	0089_QC205_230606	Interlab Duplicate	997465	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	SW319	06 Jun 2023	0089_SW319_230606	Normal	EP2307434	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	SW319	04 Sep 2023	0089_SW319_230904	Normal	EP2312228	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	19 Apr 2018	0089_SW353_180419	Normal	209623	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
WWTP	SW353	30 Jan 2020	0089_SW353_200130	Normal	EP2001004	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.52*	0.53	0.53
WWTP	SW353	02 Apr 2020	0089_SW353_200402	Normal	EP2003473	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	21 Jul 2020	0089_SW353_200721	Normal	EP2007595	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	23 Sep 2020	0089_SW353_200923	Normal	EP2010222	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
WWTP	SW353	16 Dec 2020	0089_SW353_201216	Normal	EP2014090	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	17 Mar 2021	0089_SW353_210317	Normal	EP2102901	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	08 Jun 2021	0089_SW353_210608	Normal	EP2106450	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	30 Aug 2021	0089_SW353_210830	Normal	EP2110017	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	11 Jan 2022	0089_SW353_220111	Normal	EP2200240	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	14 Mar 2022	0089_SW353_220314	Normal	EP2202980	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	07 Jun 2022	0089_SW353_220607	Normal	EP2206884	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	07 Sep 2022	0089_SW353_220907	Normal	EP2211496	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	12 Dec 2022	0089_SW353_221212	Normal	EP2216877	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	15 Mar 2023	0089_SW353_230315	Normal	EP2303229	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	07 Jun 2023	0089_SW353_230607	Normal	EP2307493	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW353	05 Sep 2023	0089_SW353_230905	Normal	EP2312188	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW370	17 Apr 2018	0089_SW370_180417	Normal	209522	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
WWTP	SW370	09 Jan 2020	0089_SW370_200109	Normal	EP2000249	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.05	0.05
WWTP	SW370	31 Mar 2020	0089_SW370_200331	Normal	EP2003372	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
WWTP	SW370	15 Jul 2020	0089_SW370_200715	Normal	EP2007383	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW370	24 Sep 2020	0089_SW370_200924	Normal	EP2010274	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08
WWTP	SW370	15 Dec 2020	0089_SW370_201215	Normal	EP2014053	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
WWTP	SW370	16 Mar 2021	0089_SW370_210316	Normal	EP2102834	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
WWTP	SW370	09 Jun 2021	0089_SW370_210609	Normal	EP2106517	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
WWTP	SW370	01 Sep 2021	0089_SW370_210901	Normal	EP2110154	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW370	10 Jan 2022	0089_SW370_220110	Normal	EP2200215	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
WWTP	SW370	14 Mar 2022	0089_SW370_220314	Normal	EP2202977	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
WWTP	SW370	07 Jun 2022	0089_SW370_220607	Normal	EP2206884	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.13*	0.13	0.13
WWTP	SW370	05 Sep 2022	0089_SW370_220905	Normal	EP2211341	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
WWTP	SW370	12 Dec 2022	0089_SW370_221212	Normal	EP2216877	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
WWTP	SW370	14 Mar 2023	0089_SW370_230314	Normal	EP2303175	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
WWTP	SW370	07 Jun 2023	0089_QC112_230607	Field Duplicate	EP2307493	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW370	07 Jun 2023	0089_QC212_230607	Interlab Duplicate	997465	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
WWTP	SW370	07 Jun 2023	0089_SW370_230607	Normal	EP2307493	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW370	05 Sep 2023	0089_SW370_230905	Normal	EP2312172	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW371	17 Apr 2018	0089_SW371_180417	Normal	209522	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
WWTP	SW371	08 Jan 2020	0089_SW371_200108	Normal	EP2000183	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
WWTP	SW371	01 Apr 2020	0089_SW371_200401	Normal	EP2003414	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW371	20 Jul 2020	0089_SW371_200720	Normal	EP2007545	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
WWTP	SW371	22 Sep 2020	0089_SW371_200922	Normal	EP2010145	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
WWTP	SW371	15 Dec 2020	0089_SW371_201215	Normal	EP2014048	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.31*	0.31	0.31
WWTP	SW371	15 Mar 2021	0089_QC103_210315	Field Duplicate	EP2102758	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.26*	0.26	0.26
WWTP	SW371	15 Mar 2021	0089_QC203_210315	Interlab Duplicate	781350	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.12*	0.12	0.12
WWTP	SW371	15 Mar 2021	0089_SW371_210315	Normal	EP2102758	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.24*	0.24	0.24
WWTP	SW371	10 Jun 2021	0089_SW371_210610	Normal	EP2106590	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW371	01 Sep 2021	0089_SW371_210901	Normal	EP2110154	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW371	11 Jan 2022	0089_SW371_220111	Normal	EP2200240	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06
WWTP	SW371	18 Mar 2022	0089_SW371_220318	Normal	EP2203195	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW371	08 Jun 2022	0089_SW371_220608	Normal	EP2206973	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.20*	0.20	0.20
WWTP	SW371	05 Sep 2022	0089_SW371_220905	Normal	EP2211344	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW371	12 Dec 2022	0089_SW371_221212	Normal	EP2216879	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
WWTP	SW371	13 Mar 2023	0089_SW371_230313	Normal	EP2303086	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
WWTP	SW371	07 Jun 2023	0089_SW371_230607	Normal	EP2307502	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06
WWTP	SW371	05 Sep 2023	0089_SW371_230905	Normal	EP2312178	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW372	13 Apr 2018	0089_SW372_180413	Normal	209417	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
WWTP	SW372	08 Jan 2020	0089_SW372_200108	Normal	EP2000183	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
WWTP	SW372	31 Mar 2020	0089_SW372_200331	Normal	EP2003372	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
WWTP	SW372	20 Jul 2020	0089_SW372_200720	Normal	EP2007545	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
WWTP	SW372	22 Sep 2020	0089_SW372_200922	Normal	EP2010145	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
WWTP	SW372	15 Dec 2020	0089_SW372_201215	Normal	EP2014044	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
WWTP	SW372	17 Mar 2021	0089_SW372_210317	Normal	EP2102901	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
WWTP	SW372	10 Jun 2021	0089_SW372_210610	Normal	EP2106590	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW372	01 Sep 2021	0089_SW372_210901	Normal	EP2110154	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW372	12 Jan 2022	0089_QC116_220112	Field Duplicate	EP2200289	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
WWTP	SW372	12 Jan 2022	0089_QC216_220112	Interlab Duplicate	855202	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1
WWTP	SW372	12 Jan 2022	0089_SW372_220112	Normal	EP2200289	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
WWTP	SW372	18 Mar 2022	0089_SW372_220318	Normal	EP2203195	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
WWTP	SW372	08 Jun 2022	0089_SW372_220608	Normal	EP2206973	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.11*	0.11	0.11
WWTP	SW372	06 Sep 2022	0089_SW372_220906	Normal	EP2211391	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08
WWTP	SW372	12 Dec 2022	0089_SW372_221212	Normal	EP2216879	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.68*	0.68	0.68
WWTP	SW372	14 Mar 2023	0089_SW372_230314	Normal	EP2303179	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
WWTP	SW372	07 Jun 2023	0089_SW372_230607	Normal	EP2307502	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08
WWTP	SW372	05 Sep 2023	0089_SW372_230905	Normal	EP2312178	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	0.10
WWTP	SW373	13 Apr 2018	0089_SW373_180413	Normal	209417	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
WWTP	SW373	08 Jan 2020	0089_SW373_200108	Normal	EP2000183	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
WWTP	SW373	31 Mar 2020	0089_SW373_200331	Normal	EP2003372	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
WWTP	SW373	20 Jul 2020	0089_SW373_200720	Normal	EP2007545	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	SW373	22 Sep 2020	0089_SW373_200922	Normal	EP2010145	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.56*	0.59	0.59
WWTP	SW373	15 Dec 2020	0089_SW373_201215	Normal	EP2014044	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
WWTP	SW373	17 Mar 2021	0089_SW373_210317	Normal	EP2102901	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
WWTP	SW373	10 Jun 2021	0089_SW373_210610	Normal	EP2106579	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
WWTP	SW373	30 Aug 2021	0089_SW373_210830	Normal	EP2110017	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.40*	0.40	0.40

Table 3 - Surface water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.002	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Freshwater 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
WWTP	**SW373**	**12 Jan 2022**	**0089_SW373_220112**	**Normal**	**EP2200289**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
WWTP	**SW373**	**18 Mar 2022**	**0089_SW373_220318**	**Normal**	**EP2203195**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.12*	0.12	0.12
WWTP	**SW373**	**08 Jun 2022**	**0089_SW373_220608**	**Normal**	**EP2206973**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW373**	**06 Sep 2022**	**0089_SW373_220906**	**Normal**	**EP2211391**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09
WWTP	**SW373**	**12 Dec 2022**	**0089_SW373_221212**	**Normal**	**EP2216879**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.26*	0.26	0.26
WWTP	**SW373**	**14 Mar 2023**	**0089_QC116_230314**	**Field Duplicate**	**EP2303179**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.15*	0.15	0.15
WWTP	**SW373**	**14 Mar 2023**	**0089_QC216_230314**	**Interlab Duplicate**	**972487**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.16*	0.16	0.16
WWTP	**SW373**	**14 Mar 2023**	**0089_SW373_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.15*	0.15	0.15
WWTP	**SW373**	**07 Jun 2023**	**0089_SW373_230607**	**Normal**	**EP2307502**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.30*	0.30	0.30
WWTP	**SW373**	**05 Sep 2023**	**0089_SW373_230905**	**Normal**	**EP2312178**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.21*	0.21	0.21
WWTP	**SW382**	**19 Apr 2018**	**0089_SW382_180419**	**Normal**	**209623**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
WWTP	**SW382**	**30 Jan 2020**	**0089_SW382_200130**	**Normal**	**EP2001004**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**02 Apr 2020**	**0089_SW382_200402**	**Normal**	**EP2003473**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**21 Jul 2020**	**0089_SW382_200721**	**Normal**	**EP2007595**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**23 Sep 2020**	**0089_SW382_200923**	**Normal**	**EP2010218**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**16 Dec 2020**	**0089_SW382_201216**	**Normal**	**EP2014104**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**17 Mar 2021**	**0089_SW382_210317**	**Normal**	**EP2102892**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**08 Jun 2021**	**0089_SW382_210608**	**Normal**	**EP2106450**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**30 Aug 2021**	**0089_SW382_210830**	**Normal**	**EP2110017**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.17*	0.17	0.17
WWTP	**SW382**	**11 Jan 2022**	**0089_SW382_220111**	**Normal**	**EP2200240**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**14 Mar 2022**	**0089_SW382_220314**	**Normal**	**EP2202980**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**07 Jun 2022**	**0089_SW382_220607**	**Normal**	**EP2206881**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**07 Sep 2022**	**0089_SW382_220907**	**Normal**	**EP2211496**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**12 Dec 2022**	**0089_SW382_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**15 Mar 2023**	**0089_SW382_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**07 Jun 2023**	**0089_SW382_230607**	**Normal**	**EP2307493**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW382**	**05 Sep 2023**	**0089_SW382_230905**	**Normal**	**EP2312188**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW383**	**19 Apr 2018**	**0089_SW383_180419**	**Normal**	**209623**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
WWTP	**SW383**	**30 Jan 2020**	**0089_SW383_200130**	**Normal**	**EP2001004**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW383**	**02 Apr 2020**	**0089_SW383_200402**	**Normal**	**EP2003473**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW383**	**21 Jul 2020**	**0089_SW383_200721**	**Normal**	**EP2007595**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW383**	**23 Sep 2020**	**0089_SW383_200923**	**Normal**	**EP2010222**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
WWTP	**SW383**	**16 Dec 2020**	**0089_SW383_201216**	**Normal**	**EP2014090**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW383**	**17 Mar 2021**	**0089_SW383_210317**	**Normal**	**EP2102892**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW383**	**08 Jun 2021**	**0089_SW383_210608**	**Normal**	**EP2106450**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW383**	**30 Aug 2021**	**0089_SW383_210830**	**Normal**	**EP2110017**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW383**	**11 Jan 2022**	**0089_SW383_220111**	**Normal**	**EP2200240**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW383**	**07 Jun 2022**	**0089_SW383_220607**	**Normal**	**EP2206884**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW383**	**07 Sep 2022**	**0089_SW383_220907**	**Normal**	**EP2211496**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW383**	**12 Dec 2022**	**0089_SW383_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW383**	**15 Mar 2023**	**0089_SW383_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW383**	**05 Sep 2023**	**0089_SW383_230905**	**Normal**	**EP2312188**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW384**	**19 Apr 2018**	**0089_SW384_180419**	**Normal**	**209623**	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
WWTP	**SW384**	**30 Jan 2020**	**0089_SW384_200130**	**Normal**	**EP2001004**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
WWTP	**SW384**	**02 Apr 2020**	**0089_SW384_200402**	**Normal**	**EP2003473**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW384**	**21 Jul 2020**	**0089_SW384_200721**	**Normal**	**EP2007595**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW384**	**23 Sep 2020**	**0089_SW384_200923**	**Normal**	**EP2010222**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
WWTP	**SW384**	**16 Dec 2020**	**0089_SW384_201216**	**Normal**	**EP2014090**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW384**	**17 Mar 2021**	**0089_SW384_210317**	**Normal**	**EP2102901**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW384**	**08 Jun 2021**	**0089_SW384_210608**	**Normal**	**EP2106450**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW384**	**30 Aug 2021**	**0089_SW384_210830**	**Normal**	**EP2110017**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
WWTP	**SW384**	**11 Jan 2022**	**0089_SW384_220111**	**Normal**	**EP2200240**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW384**	**14 Mar 2022**	**0089_SW384_220314**	**Normal**	**EP2202980**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW384**	**07 Jun 2022**	**0089_SW384_220607**	**Normal**	**EP2206884**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW384**	**07 Sep 2022**	**0089_SW384_220907**	**Normal**	**EP2211496**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW384**	**12 Dec 2022**	**0089_SW384_221212**	**Normal**	**EP2216873**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW384**	**15 Mar 2023**	**0089_SW384_230315**	**Normal**	**EP2303229**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW384**	**07 Jun 2023**	**0089_SW384_230607**	**Normal**	**EP2307493**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
WWTP	**SW384**	**05 Sep 2023**	**0089_SW384_230905**	**Normal**	**EP2312184**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**14 Jan 2020**	**0089_SW406_200114**	**Normal**	**EP2000422**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**01 Apr 2020**	**0089_SW406_200401**	**Normal**	**EP2003420**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**22 Jul 2020**	**0089_QC113_200722**	**Field Duplicate**	**EP2007649**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**22 Jul 2020**	**0089_QC213_200722**	**Interlab Duplicate**	**734409**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
HSF	**SW406**	**22 Jul 2020**	**0089_SW406_200722**	**Normal**	**EP2007649**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**21 Sep 2020**	**0089_QC111_200921**	**Field Duplicate**	**EP2010083**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**21 Sep 2020**	**0089_QC211_200921**	**Interlab Duplicate**	**746269**	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
HSF	**SW406**	**21 Sep 2020**	**0089_SW406_200921**	**Normal**	**EP2010083**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**15 Dec 2020**	**0089_SW406_201215**	**Normal**	**EP2014048**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**15 Mar 2021**	**0089_SW406_210315**	**Normal**	**EP2102756**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
HSF	**SW406**	**10 Jun 2021**	**0089_SW406_210610**	**Normal**	**EP2106590**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**31 Aug 2021**	**0089_SW406_210831**	**Normal**	**EP2110065**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.16	0.16
HSF	**SW406**	**14 Jan 2022**	**0089_SW406_220114**	**Normal**	**EP2200400**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**16 Mar 2022**	**0089_SW406_220316**	**Normal**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**07 Jun 2022**	**0089_SW406_220607**	**Normal**	**EP2206887**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**07 Sep 2022**	**0089_SW406_220907**	**Normal**	**EP2211496**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**13 Dec 2022**	**0089_SW406_221213**	**Normal**	**EP2216969**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**14 Mar 2023**	**0089_SW406_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW406**	**08 Jun 2023**	**0089_SW406_230608**	**Normal**	**EP2307592**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.08	0.08
HSF	**SW406**	**05 Sep 2023**	**0089_SW406_230905**	**Normal**	**EP2312184**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**14 Jan 2020**	**0089_SW408_200114**	**Normal**	**EP2000422**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**01 Apr 2020**	**0089_SW408_200401**	**Normal**	**EP2003420**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**22 Jul 2020**	**0089_SW408_200722**	**Normal**	**EP2007649**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**21 Sep 2020**	**0089_SW408_200921**	**Normal**	**EP2010083**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**15 Dec 2020**	**0089_SW408_201215**	**Normal**	**EP2014053**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**15 Mar 2021**	**0089_SW408_210315**	**Normal**	**EP2102756**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**10 Jun 2021**	**0089_SW408_210610**	**Normal**	**EP2106590**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**31 Aug 2021**	**0089_SW408_210831**	**Normal**	**EP2110072**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.06	0.06
HSF	**SW408**	**14 Jan 2022**	**0089_SW408_220114**	**Normal**	**EP2200400**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**16 Mar 2022**	**0089_SW408_220316**	**Normal**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**07 Jun 2022**	**0089_SW408_220607**	**Normal**	**EP2206887**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**07 Sep 2022**	**0089_SW408_220907**	**Normal**	**EP2211498**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**13 Dec 2022**	**0089_SW408_221213**	**Normal**	**EP2216969**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**14 Mar 2023**	**0089_SW408_230314**	**Normal**	**EP2303179**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW408**	**08 Jun 2023**	**0089_SW408_230608**	**Normal**	**EP2307592**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.08	0.08
HSF	**SW408**	**05 Sep 2023**	**0089_SW408_230905**	**Normal**	**EP2312184**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW410**	**14 Jan 2020**	**0089_SW410_200114**	**Normal**	**EP2000422**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW410**	**02 Apr 2020**	**0089_SW410_200402**	**Normal**	**EP2003471**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW410**	**21 Jul 2020**	**0089_SW410_200721**	**Normal**	**EP2007604**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW410**	**22 Sep 2020**	**0089_SW410_200922**	**Normal**	**EP2010145**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	**SW410**	**15 Dec 2020**	**0089_SW410_201215**	**Normal**	**EP2014044**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01

Table 3 - Surface water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.002	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Freshwater 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
HSF	SW410	17 Mar 2021	0089_SW410_210317	Normal	EP2102901	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW410	10 Jun 2021	0089_QC114_210610	Field Duplicate	EP2106590	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW410	10 Jun 2021	0089_QC214_210610	Interlab Duplicate	802734	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
HSF	SW410	10 Jun 2021	0089_SW410_210610	Normal	EP2106590	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW410	31 Aug 2021	0089_SW410_210831	Normal	EP2110065	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW410	14 Jan 2022	0089_SW410_220114	Normal	EP2200400	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW410	16 Mar 2022	0089_SW410_220316	Normal	EP2203058	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW410	07 Jun 2022	0089_SW410_220607	Normal	EP2206887	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW410	06 Sep 2022	0089_SW410_220906	Normal	EP2211391	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW410	13 Dec 2022	0089_SW410_221213	Normal	EP2216934	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW410	14 Mar 2023	0089_SW410_230314	Normal	EP2303179	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW410	08 Jun 2023	0089_SW410_230608	Normal	EP2307592	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW410	04 Sep 2023	0089_QC107_230904	Field Duplicate	EP2312228	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW410	04 Sep 2023	0089_QC207_230904	Interlab Duplicate	1023399	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
HSF	SW410	04 Sep 2023	0089_SW410_230904	Normal	EP2312228	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	14 Jan 2020	0089_SW412_200114	Normal	EP2000422	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	01 Apr 2020	0089_SW412_200401	Normal	EP2003418	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	21 Jul 2020	0089_SW412_200721	Normal	EP2007604	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
HSF	SW412	22 Sep 2020	0089_SW412_200922	Normal	EP2010145	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	15 Dec 2020	0089_SW412_201215	Normal	EP2014044	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	18 Mar 2021	0089_SW412_210318	Normal	EP2102956	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	09 Jun 2021	0089_SW412_210609	Normal	EP2106517	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	01 Sep 2021	0089_SW412_210901	Normal	EP2110155	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	14 Jan 2022	0089_SW412_220114	Normal	EP2200400	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	16 Mar 2022	0089_SW412_220316	Normal	EP2203058	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	07 Jun 2022	0089_SW412_220607	Normal	EP2206887	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	06 Sep 2022	0089_SW412_220906	Normal	EP2211401	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	14 Dec 2022	0089_SW412_221214	Normal	EP2216973	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	15 Mar 2023	0089_SW412_230315	Normal	EP2303229	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	08 Jun 2023	0089_SW412_230608	Normal	EP2307592	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	04 Sep 2023	0089_QC109_230904	Field Duplicate	EP2312228	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW412	04 Sep 2023	0089_QC209_230904	Interlab Duplicate	1023399	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
HSF	SW412	04 Sep 2023	0089_SW412_230904	Normal	EP2312228	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	14 Jan 2020	0089_SW414_200114	Normal	EP2000422	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	02 Apr 2020	0089_SW414_200402	Normal	EP2003473	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	21 Jul 2020	0089_SW414_200721	Normal	EP2007604	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
HSF	SW414	22 Sep 2020	0089_SW414_200922	Normal	EP2010145	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	15 Dec 2020	0089_SW414_201215	Normal	EP2014044	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	18 Mar 2021	0089_SW414_210318	Normal	EP2102941	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
HSF	SW414	09 Jun 2021	0089_SW414_210609	Normal	EP2106517	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	01 Sep 2021	0089_SW414_210901	Normal	EP2110155	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	14 Jan 2022	0089_SW414_220114	Normal	EP2200400	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	16 Mar 2022	0089_SW414_220316	Normal	EP2203058	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	07 Jun 2022	0089_QC116_220607	Field Duplicate	EP2206887	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	07 Jun 2022	0089_QC216_220607	Interlab Duplicate	896805	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	<0.002	<0.001	<0.001
HSF	SW414	07 Jun 2022	0089_SW414_220607	Normal	EP2206887	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	06 Sep 2022	0089_SW414_220906	Normal	EP2211401	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	14 Dec 2022	0089_SW414_221214	Normal	EP2216973	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	15 Mar 2023	0089_SW414_230315	Normal	EP2303229	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	08 Jun 2023	0089_SW414_230608	Normal	EP2307592	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW414	04 Sep 2023	0089_SW414_230904	Normal	EP2312228	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	14 Jan 2020	0089_SW416_200114	Normal	EP2000422	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	02 Apr 2020	0089_SW416_200402	Normal	EP2003473	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	21 Jul 2020	0089_SW416_200721	Normal	EP2007604	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	22 Sep 2020	0089_SW416_200922	Normal	EP2010145	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	15 Dec 2020	0089_SW416_201215	Normal	EP2014044	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	18 Mar 2021	0089_SW416_210318	Normal	EP2102941	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	09 Jun 2021	0089_SW416_210609	Normal	EP2106517	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	01 Sep 2021	0089_SW416_210901	Normal	EP2110155	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	14 Jan 2022	0089_SW416_220114	Normal	EP2200400	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	16 Mar 2022	0089_SW416_220316	Normal	EP2203058	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	07 Jun 2022	0089_SW416_220607	Normal	EP2206887	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	06 Sep 2022	0089_SW416_220906	Normal	EP2211401	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	14 Dec 2022	0089_SW416_221214	Normal	EP2216973	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	15 Mar 2023	0089_SW416_230315	Normal	EP2303229	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	08 Jun 2023	0089_SW416_230608	Normal	EP2307592	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
HSF	SW416	04 Sep 2023	0089_SW416_230904	Normal	EP2312228	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Freshwater 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

						Inorganics									Metals								
						Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																						
PFAS NEMP 2020 Freshwater 99%																						
PFAS NEMP 2020 Recreational Water																						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
FTA	**SW130**	**17 Jul 2017**	**0089_SW130_170717**	**Normal**	**198331**																	
FTA	**SW130**	**08 Jan 2020**	**0089_SW130_200108**	**Normal**	**EP2000180**	5	112	<1	117	620	689	20,000	5.25	2,590		508		1,540		593		12,000
FTA	**SW130**	**30 Mar 2020**	**0089_SW130_200330**	**Normal**	**EP2003316**	<1	117	<1	117	609	695	19,500	6.60	2,720		523		1,630		673		11,900
FTA	**SW130**	**15 Jul 2020**	**0089_SW130_200715**	**Normal**	**EP2007383**	<1	124	<1	124	589	654	18,800	5.24	2,720		467		1,410		586		11,500
FTA	**SW130**	**22 Sep 2020**	**0089_SW130_200922**	**Normal**	**EP2010153**	<1	132	<1	132	613	674	19,600	4.72	2,760		485		1,510		641		11,700
FTA	**SW130**	**14 Dec 2020**	**0089_SW130_201214**	**Normal**	**EP2013985**	<1	134	<1	134	622	704	19,800	6.18	2,910		498		1,590		677		12,200
FTA	**SW130**	**15 Mar 2021**	**0089_SW130_210315**	**Normal**	**EP2102756**	<1	108	<1	108	589	714	18,700	9.61	2,850		491		1,570		658		12,500
FTA	**SW130**	**08 Jun 2021**	**0089_SW130_210608**	**Normal**	**EP2106465**	<1	117	<1	117	592	650	18,900	4.68	2,720		464		1,460		606		11,300
FTA	**SW130**	**30 Aug 2021**	**0089_SW130_210830**	**Normal**	**EP2110021**	<1	119	<1	119	559	583	17,700	2.09	2,770		424		1,310		584		10,100
FTA	**SW130**	**10 Jan 2022**	**0089_SW130_220110**	**Normal**	**EP2200215**	<1	128	<1	128	621	603	20,000	1.50	2,630		434		1,290		556		10,600
FTA	**SW130**	**14 Mar 2022**	**0089_SW130_220314**	**Normal**	**EP2202977**	<1	120	<1	120	625	681	20,100	4.24	2,690		478		1,550		632		11,800
FTA	**SW130**	**07 Jun 2022**	**0089_SW130_220607**	**Normal**	**EP2206881**	<1	123	<1	123	562	542	18,000	1.72	2,470		435		1,250		544		9,290
FTA	**SW130**	**05 Sep 2022**	**0089_SW130_220905**	**Normal**	**EP2211344**	<1	133	<1	133	583	620	18,700	3.07	2,560		426		1,380		617		10,800
FTA	**SW130**	**12 Dec 2022**	**0089_SW130_221212**	**Normal**	**EP2216879**	<1	148	<1	148	636	687	20,600	3.82	2,510		476		1,480		585		12,100
FTA	**SW130**	**13 Mar 2023**	**0089_QC102_230313**	**Field Duplicate**	**EP2303086**	<1	135	<1	135	631	677	20,200	3.50	2,830		466		1,480		572		11,900
FTA	**SW130**	**13 Mar 2023**	**0089_QC202_230313**	**Interlab Duplicate**	**972487**																	
FTA	**SW130**	**13 Mar 2023**	**0089_SW130_230313**	**Normal**	**EP2303086**	<1	137	<1	137	628	676	20,100	3.71	2,800		466		1,470		569		11,900
FTA	**SW130**	**07 Jun 2023**	**0089_SW130_230607**	**Normal**	**EP2307502**	<1	125	<1	125	609	615	19,500	0.46	2,710		461		1,260		370		11,000
FTA	**SW130**	**05 Sep 2023**	**0089_SW130_230905**	**Normal**	**EP2312188**	<1	129	<1	129	577	650	18,500	6.01	2,510		444		1,440		546		11,400
FTA	**SW132**	**17 Jul 2017**	**0089_QC1SW_170717**	**Field Duplicate**	**198331**		120					20,000	-1.6			400		1,200		380		11,000
FTA	**SW132**	**17 Jul 2017**	**0089_QC2SW_170717**	**Interlab Duplicate**	**555139**	<10	100					21,000			480		1,500		490		11,000	
FTA	**SW132**	**17 Jul 2017**	**0089_SW132_170717**	**Normal**	**198331**		140					20,000	-0.52			410		1,300		380		11,000
FTA	**SW132**	**08 Jan 2020**	**0089_SW132_200108**	**Normal**	**EP2000180**	7	112	<1	118	628	700	20,200	5.41	2,690		514		1,560		601		12,200
FTA	**SW132**	**30 Mar 2020**	**0089_SW132_200330**	**Normal**	**EP2003316**	<1	120	<1	120	609	726	19,500	8.80	2,720		535		1,680		700		12,500
FTA	**SW132**	**15 Jul 2020**	**0089_QC103_200715**	**Field Duplicate**	**EP2007383**	<1	124	<1	124	592	631	18,900	3.12	2,730		448		1,350		563		11,100
FTA	**SW132**	**15 Jul 2020**	**0089_QC203_200215**	**Interlab Duplicate**	**732844**	<10	120	<20	120			20,000			470		1,400		430		12,000	
FTA	**SW132**	**15 Jul 2020**	**0089_SW132_200715**	**Normal**	**EP2007383**	<1	123	<1	123	593	671	18,900	6.19	2,740		474		1,440		602		11,800
FTA	**SW132**	**22 Sep 2020**	**0089_SW132_200922**	**Normal**	**EP2010153**	<1	134	<1	134	619	661	19,800	3.31	2,760		462		1,480		625		11,500
FTA	**SW132**	**14 Dec 2020**	**0089_QC107_201214**	**Field Duplicate**	**EP2013988**	<1	125	<1	125	638	728	20,300	6.60	3,030		527		1,650		712		12,600
FTA	**SW132**	**14 Dec 2020**	**0089_QC207_201114**	**Interlab Duplicate**	**765054**	<10	150	<20	150			20,000			470		1,400		440		12,000	
FTA	**SW132**	**14 Dec 2020**	**0089_SW132_201214**	**Normal**	**EP2013988**	<1	124	<1	124	639	765	20,300	8.99	3,050		561		1,740		757		13,200
FTA	**SW132**	**15 Mar 2021**	**0089_SW132_210315**	**Normal**	**EP2102756**	<1	118	<1	118	647	646	20,800	0.07	2,790		424		1,290		392		11,700
FTA	**SW132**	**08 Jun 2021**	**0089_SW132_210608**	**Normal**	**EP2106465**	<1	117	<1	117	588	618	18,800	2.51	2,660		441		1,410		580		10,700
FTA	**SW132**	**30 Aug 2021**	**0089_SW132_210830**	**Normal**	**EP2110021**	<1	120	<1	120	547	578	17,500	2.69	2,470		420		1,300		578		10,000
FTA	**SW132**	**10 Jan 2022**	**0089_SW132_220110**	**Normal**	**EP2200215**	<1	127	<1	127	616	585	19,800	2.51	2,620		418		1,250		534		10,300
FTA	**SW132**	**14 Mar 2022**	**0089_SW132_220314**	**Normal**	**EP2202977**	<1	121	<1	121	632	697	20,300	4.89	2,740		486		1,580		643		12,100
FTA	**SW132**	**07 Jun 2022**	**0089_SW132_220607**	**Normal**	**EP2206881**	<1	130	<1	130	574	549	18,400	2.20	2,500		442		1,270		546		9,390
FTA	**SW132**	**05 Sep 2022**	**0089_QC104_220905**	**Field Duplicate**	**EP2211344**	<1	126	<1	126	569	592	18,200	2.00	2,550		410		1,320		590		10,300
FTA	**SW132**	**05 Sep 2022**	**0089_QC204_220905**	**Interlab Duplicate**	**920981**																	
FTA	**SW132**	**05 Sep 2022**	**0089_SW132_220905**	**Normal**	**EP2211344**	<1	125	<1	125	575	627	18,400	4.27	2,590		431		1,400		623		10,900
FTA	**SW132**	**12 Dec 2022**	**0089_QC104_221212**	**Field Duplicate**	**EP2216879**	<1	135	<1	135	632	715	20,500	6.17	2,440		481		1,560		564		12,600
FTA	**SW132**	**12 Dec 2022**	**0089_QC204_221212**	**Interlab Duplicate**	**950091**																	
FTA	**SW132**	**12 Dec 2022**	**0089_SW132_221212**	**Normal**	**EP2216879**	<1	138	<1	138	635	685	20,600	3.81	2,460		457		1,490		535		12,100
FTA	**SW132**	**13 Mar 2023**	**0089_SW132_230313**	**Normal**	**EP2303086**	<1	129	<1	129	625	665	19,900	3.14	2,930		458		1,450		560		11,700
FTA	**SW132**	**07 Jun 2023**	**0089_SW132_230607**	**Normal**	**EP2307502**	<1	125	<1	125	613	615	19,600	0.18	2,780		476		1,260		373		11,000
FTA	**SW132**	**05 Sep 2023**	**0089_SW132_230905**	**Normal**	**EP2312188**	<1	130	<1	130	585	638	18,900	4.30	2,370		431		1,410		508		11,200
FTA	**SW134**	**17 Jul 2017**	**0089_SW134_170717**	**Normal**	**198331**																	
FTA	**SW134**	**08 Jan 2020**	**0089_QC109_200108**	**Field Duplicate**	**EP2000180**	4	115	<1	119	620	734	20,000	8.44	2,550		541		1,630		622		12,800
FTA	**SW134**	**08 Jan 2020**	**0089_QC209_200108**	**Interlab Duplicate**	**696100**	<10	130					32,000			440		1,200		400		13,000	
FTA	**SW134**	**08 Jan 2020**	**0089_SW134_200108**	**Normal**	**EP2000180**	2	115	<1	118	621	723	19,900	7.57	2,750		531		1,610		609		12,600
FTA	**SW134**	**31 Mar 2020**	**0089_QC101_200331**	**Field Duplicate**	**EP2003367**	<1	126	<1	126	608	732	19,400	9.30	2,780		541		1,740		717		12,500
FTA	**SW134**	**31 Mar 2020**	**0089_QC201_200331**	**Interlab Duplicate**	**711434**	<20	130	<20	130			22,000			400		1,200		410		10,000	
FTA	**SW134**	**31 Mar 2020**	**0089_SW134_200331**	**Normal**	**EP2003367**	<1	130	<1	130	613	736	19,600	9.16	2,760		542		1,740		713		12,600
FTA	**SW134**	**15 Jul 2020**	**0089_SW134_200715**	**Normal**	**EP2007383**	<1	123	<1	123	596	687	19,000	7.13	2,760		486		1,470		621		12,100
FTA	**SW134**	**22 Sep 2020**	**0089_QC116_200922**	**Field Duplicate**	**EP2010153**	<1	134	<1	134	619	661	19,800	3.29	2,780		462		1,480		629		11,500
FTA	**SW134**	**22 Sep 2020**	**0089_QC216_200921**	**Interlab Duplicate**	**746269**	<10	120	<20	120			20,000			460		1,400		400		11,000	
FTA	**SW134**	**22 Sep 2020**	**0089_SW134_200922**	**Normal**	**EP2010153**	<1	135	<1	135	610	701	19,500	6.97	2,750		489		1,570		670		12,200
FTA	**SW134**	**14 Dec 2020**	**0089_SW134_201214**	**Normal**	**EP2013988**	<1	133	<1	133	635	739	20,200	7.57	3,020		535		1,670		726		12,800
FTA	**SW134**	**15 Mar 2021**	**0089_SW134_210315**	**Normal**	**EP2102756**	<1	113	<1	113	592	721	18,900	9.76	2,740		495		1,590		666		12,600
FTA	**SW134**	**08 Jun 2021**	**0089_QC110_210608**	**Field Duplicate**	**EP2106450**	<1	117	<1	117	571	671	18,100	8.02	2,790		462		1,490		626		11,700
FTA	**SW134**	**08 Jun 2021**	**0089_QC210_210608**	**Interlab Duplicate**	**802464**	11	120					20,000			600		1,700		550		13,000	
FTA	**SW134**	**08 Jun 2021**	**0089_SW134_210608**	**Normal**	**EP2106450**	<1	116	<1	116	562	676	17,800	9.18	2,780		467		1,500		626		11,800
FTA	**SW134**	**30 Aug 2021**	**0089_QC104_210830**	**Field Duplicate**	**EP2110021**	<1	120	<1	120	551	594	17,600	3.78	2,500		430		1,330		595		10,300
FTA	**SW134**	**30 Aug 2021**	**0089_QC204_210830**	**Interlab Duplicate**	**820919**																	
FTA	**SW134**	**30 Aug 2021**	**0089_SW134_210830**	**Normal**	**EP2110021**	<1	117	<1	117	558	600	17,800	3.69	2,560		435		1,350		600		10,400
FTA	**SW134**	**10 Jan 2022**	**0089_QC102_220110**	**Field Duplicate**	**EP2200212**																	
FTA	**SW134**	**10 Jan 2022**	**0089_QC202_220110**	**Interlab Duplicate**	**854607**																	
FTA	**SW134**	**10 Jan 2022**	**0089_SW134_220110**	**Normal**	**EP2200212**	<1	126	<1	126	609	585	19,600	1.94	2,560		418		1,250		537		10,300
FTA	**SW134**	**14 Mar 2022**	**0089_QC107_220314**	**Field Duplicate**	**EP2202977**	<1	122	<1	122	636	674	20,500	2.92	2,650		473		1,530		616		11,700
FTA	**SW134**	**14 Mar 2022**	**0089_QC207_220314**	**Interlab Duplicate**	**872911**																	
FTA	**SW134**	**14 Mar 2022**	**0089_SW134_220314**	**Normal**	**EP2202977**	<1	121	<1	121	629	697	20,200	5.16	2,720		492		1,580		639		12,100
FTA	**SW134**	**07 Jun 2022**	**0089_QC108_220607**	**Field Duplicate**	**EP2206881**																	
FTA	**SW134**	**07 Jun 2022**	**0089_QC208_220607**	**Interlab Duplicate**	**896805**																	
FTA	**SW134**	**07 Jun 2022**	**0089_SW134_220607**	**Normal**	**EP2206881**	<1	128	<1	128	579	564	18,600	1.33	2,490		457		1,310		561		9,630
FTA	**SW134**	**05 Sep 2022**	**0089_SW134_220905**	**Normal**	**EP2211344**	<1	127	<1	127	586	620	18,800	2.81	2,570		424		1,380		618		10,800
FTA	**SW134**	**12 Dec 2022**	**0089_QC112_221212**	**Field Duplicate**	**EP2216879**	<1	139	<1	139	632	675	20,500	3.26	2,450		451		1,470		529		11,900
FTA	**SW134**	**12 Dec 2022**	**0089_QC212_221212**	**Interlab Duplicate**	**950091**																	
FTA	**SW134**	**12 Dec 2022**	**0089_SW134_221212**	**Normal**	**EP2216879**	<1	136	<1	136	629	704	20,400	5.59	2,460		473		1,540		555		12,400
FTA	**SW134**	**13 Mar 2023**	**0089_SW134_230313**	**Normal**	**EP2303086**	<1	124	<1	124	625	672	20,000	3.60	2,810		463		1,470		566		11,800
FTA	**SW134**	**07 Jun 2023**	**0089_SW134_230607**	**Normal**	**EP2307502**	<1	124	<1	124	610	622	19,500	1.04	2,740		476		1,290		379		11,100
FTA	**SW134**	**05 Sep 2023**	**0089_SW134_230905**	**Normal**	**EP2312188**	<1	129	<1	129	599	641	19,300	3.39	2,500		439		1,430		561		11,200
Demolition Ground	**SW150**	**24 Aug 2017**	**0089_SW150_170824**	**Normal**	**199846**																	
Demolition Ground	**SW150**	**08 Jan 2020**	**0089_SW150_200108**	**Normal**	**EP2000180**	<1	118	<1	118	538	655	17,200	9.84	2,410		454		1,470		610		11,400
Demolition Ground	**SW150**	**30 Mar 2020**	**0089_SW150_200330**	**Normal**	**EP2003309**	<1	115	<1	115	578	692	18,400	8.92	2,750		485		1,560		680		12,000
Demolition Ground	**SW150**	**20 Jul 2020**	**0089_SW150_200720**	**Normal**	**EP2007545**	<1	122	<1	122	596	702	19,100	8.16	2,650		493		1,540		624		12,300
Demolition Ground	**SW150**	**23 Sep 2020**	**0089_SW150_200923**	**Normal**	**EP2010218**	<1	124	<1	124	615	658	19,500	3.37	3,020		474		1,490		635		11,400
Demolition Ground	**SW150**	**14 Dec 2020**	**0089_SW150_201214**	**Normal**	**EP2013973**	<1	121	<1	121	609	724	19,400	8.62	2,840		518		1,650		716		12,500
Demolition Ground	**SW150**	**16 Mar 2021**	**0089_SW150_210316**	**Normal**	**EP2102836**	<1	113	<1	113	653	768	20,900	8.12	2,940		542		1,700		732		13,400
Demolition Ground	**SW150**	**08 Jun 2021**	**0089_QC109_210608**	**Field Duplicate**	**EP2106465**	<1	113	<1	113	592	639	18,900	3.84	2,720		454		1,440		601		11,100
Demolition Ground	**SW150**	**08 Jun 2021**	**0089_QC209_210608**	**Interlab Duplicate**	**802464**	13	110					20,000			640		1,800		560		14,000	
Demolition Ground	**SW150**	**08 Jun 2021**	**0089_SW150_210608**	**Normal**	**EP2106465**	<1	114	<1	114	597	621	19,100	1.98	2,670		438		1,390		578		10,800
Demolition Ground	**SW150**	**30 Aug 2021**	**0089_QC108_210830**	**Field Duplicate**	**EP2110017**	<1	120	<1	120	538	575	17,200	3.37	2,400		420		1,290		574		9,960
Demolition Ground	**SW150**	**30 Aug 2021**	**0089_QC208_210830**	**Interlab Duplicate**	**820919**																	
Demolition Ground	**SW150**	**30 Aug 2021**	**0089_SW150_210830**	**Normal**	**EP2110017**	<1	123	<1	123	547	612	17,500	5.58	2,440		445		1,370		606		10,600
Demolition Ground	**SW150**	**10 Jan 2022**	**0089_SW150_220110**	**Normal**	**EP2200218**	<1	120	<1	120	613	671	19,800	4.54	2,490		440		1,420		572		11,900
Demolition Ground	**SW150**	**15 Mar 2022**	**0089_QC117_220315**	**Field Duplicate**	**EP2203019**	<1	120	<1	120	590	691	18,900	7.91	2,600		481		1,560		650		12,000
Demolition Ground	**SW150**	**15 Mar 2022**	**0089_QC217_220315**	**Interlab Duplicate**	**872903**																	
Demolition Ground	**SW150**	**15 Mar 2022**	**0089_SW150_220315**	**Normal**	**EP2203019**	<1	123	<1	123	587	623	18,800	3.02	2,600		439		1,420		584		10,800

Table 3 - Surface water Analytical Results

						Inorganics									Metals								
						Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																						
PFAS NEMP 2020 Freshwater 99%																						
PFAS NEMP 2020 Recreational Water																						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
Demolition Ground	**SW150**	**08 Jun 2022**	**0089_SW150_220608**	**Normal**	**EP2206970**	<1	130	<1	130	554	641	17,500	7.29	2,770		459		1,510		603		11,000
Demolition Ground	**SW150**	**05 Sep 2022**	**0089_SW150_220905**	**Normal**	**EP2211347**	<1	125	<1	125	576	608	18,400	2.70	2,600		426		1,370		489		10,600
Demolition Ground	**SW150**	**12 Dec 2022**	**0089_SW150_221212**	**Normal**	**EP2216873**	<1	133	<1	133	594	657	19,000	5.03	2,650		453		1,400		561		11,600
Demolition Ground	**SW150**	**15 Mar 2023**	**0089_SW150_230315**	**Normal**	**EP2303227**	<1	125	<1	125	605	673	19,300	5.37	2,780		471		1,490		549		11,800
Demolition Ground	**SW150**	**07 Jun 2023**	**0089_QC115_230607**	**Field Duplicate**	**EP2307498**	<1	119	<1	119	555	601	17,600	4.02	2,690		485		1,240		378		10,700
Demolition Ground	**SW150**	**07 Jun 2023**	**0089_QC215_230607**	**Interlab Duplicate**	**997465**																	
Demolition Ground	**SW150**	**07 Jun 2023**	**0089_SW150_230607**	**Normal**	**EP2307498**	<1	136	<1	136	546	606	17,400	5.19	2,530		486		1,240		388		10,800
Demolition Ground	**SW150**	**11 Sep 2023**	**0089_SW150_230911**	**Normal**	**EP2312525**	<1	162	<1	162	564	638	18,000	6.20	2,530		449		1,450		532		11,100
Demolition Ground	**SW152**	**24 Aug 2017**	**0089_SW152_170824**	**Normal**	**199846**		130					19,000	-0.4			410		1,300		390		11,000
Demolition Ground	**SW152**	**08 Jan 2020**	**0089_SW152_200108**	**Normal**	**EP2000180**	<1	111	<1	111	602	711	19,400	8.31	2,520		526		1,580		600		12,400
Demolition Ground	**SW152**	**30 Mar 2020**	**0089_SW152_200330**	**Normal**	**EP2003309**	<1	115	<1	115	584	736	18,600	11.6	2,740		516		1,650		714		12,800
Demolition Ground	**SW152**	**20 Jul 2020**	**0089_SW152_200720**	**Normal**	**EP2007545**	<1	123	<1	123	599	685	19,200	6.64	2,660		480		1,500		603		12,000
Demolition Ground	**SW152**	**23 Sep 2020**	**0089_SW152_200923**	**Normal**	**EP2010218**	<1	125	<1	125	605	692	19,200	6.70	2,920		489		1,560		666		12,000
Demolition Ground	**SW152**	**14 Dec 2020**	**0089_SW152_201214**	**Normal**	**EP2013973**	<1	120	<1	120	608	688	19,400	6.16	2,810		495		1,560		677		11,900
Demolition Ground	**SW152**	**16 Mar 2021**	**0089_SW152_210316**	**Normal**	**EP2102836**	<1	114	<1	114	656	725	21,000	5.00	2,930		515		1,620		690		12,600
Demolition Ground	**SW152**	**08 Jun 2021**	**0089_SW152_210608**	**Normal**	**EP2106465**	<1	113	<1	113	589	650	18,800	4.97	2,700		463		1,460		611		11,300
Demolition Ground	**SW152**	**30 Aug 2021**	**0089_SW152_210830**	**Normal**	**EP2110017**	<1	105	<1	105	554	578	17,400	2.05	2,950		417		1,300		577		10,000
Demolition Ground	**SW152**	**10 Jan 2022**	**0089_SW152_220110**	**Normal**	**EP2200218**	<1	138	<1	138	613	664	19,800	4.00	2,500		433		1,400		562		11,800
Demolition Ground	**SW152**	**15 Mar 2022**	**0089_SW152_220315**	**Normal**	**EP2203019**	<1	121	<1	121	592	669	19,000	6.06	2,600		465		1,520		631		11,600
Demolition Ground	**SW152**	**08 Jun 2022**	**0089_SW152_220608**	**Normal**	**EP2206970**	<1	125	<1	125	551	653	17,700	8.51	2,350		472		1,540		616		11,200
Demolition Ground	**SW152**	**08 Jun 2022**	**0089_SW152_220608**	**Normal**	**EP2208241**											441		1,330		492		9,490
Demolition Ground	**SW152**	**05 Sep 2022**	**0089_QC103_220905**	**Field Duplicate**	**EP2211347**	<1	122	<1	122	574	613	18,300	3.27	2,670		430		1,380		495		10,700
Demolition Ground	**SW152**	**05 Sep 2022**	**0089_QC203_220905**	**Interlab Duplicate**	**920981**																	
Demolition Ground	**SW152**	**05 Sep 2022**	**0089_SW152_220905**	**Normal**	**EP2211347**	<1	122	<1	122	578	612	18,500	2.81	2,590		424		1,370		484		10,700
Demolition Ground	**SW152**	**12 Dec 2022**	**0089_SW152_221212**	**Normal**	**EP2216873**	<1	139	<1	139	656	671	21,100	1.08	2,810		466		1,450		584		11,800
Demolition Ground	**SW152**	**15 Mar 2023**	**0089_SW152_230315**	**Normal**	**EP2303227**	<1	126	<1	126	608	653	19,400	3.51	2,820		443		1,420		531		11,500
Demolition Ground	**SW152**	**07 Jun 2023**	**0089_SW152_230607**	**Normal**	**EP2307498**	<1	120	<1	120	545	605	17,400	5.25	2,490		477		1,240		384		10,800
Demolition Ground	**SW152**	**11 Sep 2023**	**0089_SW152_230911**	**Normal**	**EP2312525**	<1	148	<1	148	571	644	18,300	5.94	2,510		452		1,460		537		11,200
Demolition Ground	**SW154**	**24 Aug 2017**	**0089_SW154_170824**	**Normal**	**199846**		130					20,000	1.2			420		1,300		400		11,000
Demolition Ground	**SW154**	**08 Jan 2020**	**0089_QC104_200108**	**Field Duplicate**	**EP2000180**	<1	116	<1	116	594	715	18,900	9.24	2,820		522		1,580		602		12,500
Demolition Ground	**SW154**	**08 Jan 2020**	**0089_QC204_200108**	**Interlab Duplicate**	**696100**	<10	140					21,000			440		1,200		410		12,000	
Demolition Ground	**SW154**	**08 Jan 2020**	**0089_SW154_200108**	**Normal**	**EP2000180**	<1	118	<1	118	576	700	18,400	9.68	2,650		515		1,560		600		12,200
Demolition Ground	**SW154**	**30 Mar 2020**	**0089_SW154_200330**	**Normal**	**EP2003309**	<1	115	<1	115	583	714	18,600	10.1	2,710		497		1,610		700		12,400
Demolition Ground	**SW154**	**20 Jul 2020**	**0089_SW154_200720**	**Normal**	**EP2007545**	<1	123	<1	123	585	652	18,700	5.38	2,660		458		1,440		574		11,400
Demolition Ground	**SW154**	**22 Sep 2020**	**0089_SW154_200922**	**Normal**	**EP2010153**	<1	124	<1	124	619	695	19,800	5.79	2,800		494		1,550		662		12,100
Demolition Ground	**SW154**	**14 Dec 2020**	**0089_SW154_201214**	**Normal**	**EP2013989**	<1	122	<1	122	636	733	20,200	7.11	3,050		518		1,660		714		12,700
Demolition Ground	**SW154**	**16 Mar 2021**	**0089_SW154_210316**	**Normal**	**EP2102836**	<1	114	<1	114	663	702	21,300	2.84	2,870		493		1,570		670		12,200
Demolition Ground	**SW154**	**08 Jun 2021**	**0089_SW154_210608**	**Normal**	**EP2106465**	<1	111	<1	111	588	651	18,800	5.16	2,640		465		1,470		614		11,300
Demolition Ground	**SW154**	**30 Aug 2021**	**0089_SW154_210830**	**Normal**	**EP2110017**	<1	115	<1	115	547	568	17,500	1.88	2,440		406		1,270		566		9,850
Demolition Ground	**SW154**	**10 Jan 2022**	**0089_SW154_220110**	**Normal**	**EP2200218**	<1	120	<1	120	591	660	19,000	5.55	2,510		433		1,400		561		11,700
Demolition Ground	**SW154**	**15 Mar 2022**	**0089_QC113_220315**	**Field Duplicate**	**EP2203019**																	
Demolition Ground	**SW154**	**15 Mar 2022**	**0089_QC213_220315**	**Interlab Duplicate**	**872903**																	
Demolition Ground	**SW154**	**15 Mar 2022**	**0089_SW154_220315**	**Normal**	**EP2203019**	<1	119	<1	119	603	662	19,400	4.68	2,580		461		1,500		622		11,500
Demolition Ground	**SW154**	**08 Jun 2022**	**0089_SW154_220608**	**Normal**	**EP2206970**	<1	125	<1	125	531	636	16,800	9.00	2,620		460		1,500		602		10,900
Demolition Ground	**SW154**	**05 Sep 2022**	**0089_SW154_220905**	**Normal**	**EP2211347**	<1	122	<1	122	574	624	18,400	4.16	2,520		435		1,400		498		10,900
Demolition Ground	**SW154**	**12 Dec 2022**	**0089_QC109_221212**	**Field Duplicate**	**EP2216873**																	
Demolition Ground	**SW154**	**12 Dec 2022**	**0089_QC209_221212**	**Interlab Duplicate**	**950091**																	
Demolition Ground	**SW154**	**12 Dec 2022**	**0089_SW154_221212**	**Normal**	**EP2216873**	<1	133	<1	133	684	658	22,100	1.97	2,780		450		1,410		566		11,600
Demolition Ground	**SW154**	**15 Mar 2023**	**0089_SW154_230315**	**Normal**	**EP2303227**	<1	124	<1	124	602	669	19,200	5.32	2,770		456		1,450		550		11,800
Demolition Ground	**SW154**	**07 Jun 2023**	**0089_SW154_230607**	**Normal**	**EP2307498**	<1	120	<1	120	536	611	17,200	6.52	2,350		485		1,250		395		10,900
Demolition Ground	**SW154**	**11 Sep 2023**	**0089_SW154_230911**	**Normal**	**EP2312525**	<1	137	<1	137	598	654	19,200	4.51	2,560		454		1,480		538		11,400
Demolition Ground	**SW156**	**24 Aug 2017**	**0089_SW156_170824**	**Normal**	**199846**																	
Demolition Ground	**SW156**	**08 Jan 2020**	**0089_SW156_200108**	**Normal**	**EP2000180**	<1	118	<1	118	642	745	20,200	7.37	3,380		549		1,650		629		13,000
Demolition Ground	**SW156**	**30 Mar 2020**	**0089_SW156_200330**	**Normal**	**EP2003309**	<1	114	<1	114	562	709	17,800	11.6	2,750		500		1,600		688		12,300
Demolition Ground	**SW156**	**20 Jul 2020**	**0089_SW156_200720**	**Normal**	**EP2007545**	<1	123	<1	123	594	679	19,000	6.74	2,650		478		1,490		601		11,900
Demolition Ground	**SW156**	**23 Sep 2020**	**0089_SW156_200923**	**Normal**	**EP2010218**	<1	125	<1	125	619	664	19,700	3.53	2,920		469		1,510		641		11,500
Demolition Ground	**SW156**	**14 Dec 2020**	**0089_SW156_201214**	**Normal**	**EP2013989**	<1	121	<1	121	620	721	19,600	7.53	3,120		513		1,630		697		12,500
Demolition Ground	**SW156**	**16 Mar 2021**	**0089_QC111_210316**	**Field Duplicate**	**EP2102836**	<1	116	<1	116	650	735	20,800	6.07	2,950		520		1,630		694		12,800
Demolition Ground	**SW156**	**16 Mar 2021**	**0089_QC211_210316**	**Interlab Duplicate**	**781350**	<10	130					23,000			520		1,500		440		12,000	
Demolition Ground	**SW156**	**16 Mar 2021**	**0089_SW156_210316**	**Normal**	**EP2102836**	<1	113	<1	113	663	739	21,200	5.43	3,000		515		1,630		700		12,900
Demolition Ground	**SW156**	**08 Jun 2021**	**0089_SW156_210608**	**Normal**	**EP2106465**	<1	113	<1	113	567	656	18,000	7.24	2,750		463		1,470		618		11,400
Demolition Ground	**SW156**	**30 Aug 2021**	**0089_SW156_210830**	**Normal**	**EP2110017**	<1	116	<1	116	544	577	17,400	2.94	2,460		414		1,300		576		10,000
Demolition Ground	**SW156**	**10 Jan 2022**	**0089_QC107_220110**	**Field Duplicate**	**EP2200218**																	
Demolition Ground	**SW156**	**10 Jan 2022**	**0089_QC207_220110**	**Interlab Duplicate**	**854607**																	
Demolition Ground	**SW156**	**10 Jan 2022**	**0089_SW156_220110**	**Normal**	**EP2200218**	<1	120	<1	120	602	712	19,500	8.34	2,400		464		1,500		513		12,700
Demolition Ground	**SW156**	**15 Mar 2022**	**0089_SW156_220315**	**Normal**	**EP2203019**	<1	121	<1	121	584	658	18,700	5.98	2,590		459		1,500		619		11,400
Demolition Ground	**SW156**	**08 Jun 2022**	**0089_SW156_220608**	**Normal**	**EP2206970**	<1	123	<1	123	559	623	18,000	5.38	2,360		450		1,460		586		10,700
Demolition Ground	**SW156**	**05 Sep 2022**	**0089_SW156_220905**	**Normal**	**EP2211347**	<1	122	<1	122	577	624	18,500	3.88	2,540		434		1,400		500		10,900
Demolition Ground	**SW156**	**12 Dec 2022**	**0089_SW156_221212**	**Normal**	**EP2216873**	<1	131	<1	131	652	638	20,900	1.10	2,900		452		1,390		557		11,200
Demolition Ground	**SW156**	**15 Mar 2023**	**0089_SW156_230315**	**Normal**	**EP2303227**	<1	128	<1	128	621	680	19,900	4.50	2,760		458		1,470		550		12,000
Demolition Ground	**SW156**	**07 Jun 2023**	**0089_SW156_230607**	**Normal**	**EP2307498**	<1	120	<1	120	540	599	17,200	5.13	2,540		464		1,220		388		10,700
Demolition Ground	**SW156**	**11 Sep 2023**	**0089_SW156_230911**	**Normal**	**EP2312525**	<1	125	<1	125	576	654	18,500	6.31	2,500		451		1,480		542		11,400
WWTP	**SW305**	**17 Apr 2018**	**0089_SW305_180417**	**Normal**	**209522**																	
WWTP	**SW305**	**08 Jan 2020**	**0089_SW305_200108**	**Normal**	**EP2000183**	3	121	<1	124	590	679	18,800	7.02	2,760		465		1,510		558		11,900
WWTP	**SW305**	**31 Mar 2020**	**0089_SW305_200331**	**Normal**	**EP2003372**	<1	118	<1	118	610	740	19,500	9.67	2,750		521		1,690		719		12,800
WWTP	**SW305**	**20 Jul 2020**	**0089_SW305_200720**	**Normal**	**EP2007545**	<1	130	<1	130	563	686	18,000	9.79	2,550		480		1,510		608		12,000
WWTP	**SW305**	**22 Sep 2020**	**0089_SW305_200922**	**Normal**	**EP2010145**	<1	143	<1	143	589	566	18,800	2.00	2,690		406		1,280		538		9,810
WWTP	**SW305**	**15 Dec 2020**	**0089_SW305_201215**	**Normal**	**EP2014048**	<1	125	<1	125	613	700	19,600	6.58	2,780		510		1,580		696		12,100
WWTP	**SW305**	**15 Mar 2021**	**0089_SW305_210315**	**Normal**	**EP2102758**	<1	110	<1	110	585	714	18,600	9.99	2,780		496		1,570		658		12,500
WWTP	**SW305**	**10 Jun 2021**	**0089_SW305_210610**	**Normal**	**EP2106582**	<1	144	<1	144	581	658	18,600	6.20	2,580		463		1,500		615		11,400
WWTP	**SW305**	**01 Sep 2021**	**0089_SW305_210901**	**Normal**	**EP2110154**	<1	118	<1	118	534	598	17,200	5.59	2,250		422		1,340		546		10,400
WWTP	**SW305**	**11 Jan 2022**	**0089_SW305_220111**	**Normal**	**EP2200240**	<1	132	<1	132	595	610	19,200	1.20	2,450		416		1,350		484		10,700
WWTP	**SW305**	**18 Mar 2022**	**0089_SW305_220318**	**Normal**	**EP2203195**	<1	130	<1	130	603	638	19,300	2.83	2,700		466		1,440		541		11,100
WWTP	**SW305**	**08 Jun 2022**	**0089_SW305_220608**	**Normal**	**EP2206973**	<1	127	<1	127	604	682	19,300	6.00	2,760		492		1,600		642		11,700
WWTP	**SW305**	**05 Sep 2022**	**0089_QC115_220905**	**Field Duplicate**	**EP2211344**	<1	152	<1	152	532	541	17,000	0.85	2,360		378		1,210		528		9,400
WWTP	**SW305**	**05 Sep 2022**	**0089_QC215_220905**	**Interlab Duplicate**	**920981**																	
WWTP	**SW305**	**05 Sep 2022**	**0089_SW305_220905**	**Normal**	**EP2211344**	<1	145	<1	145	546	551	17,500	0.43	2,390		386		1,240		544		9,560
WWTP	**SW305**	**12 Dec 2022**	**0089_SW305_221212**	**Normal**	**EP2216879**	<1	149	<1	149	682	679	22,300	0.19	2,400		457		1,470		533		12,000
WWTP	**SW305**	**13 Mar 2023**	**0089_QC114_230313**	**Field Duplicate**	**EP2303086**	<1	127	<1	127	620	654	19,900	2.67	2,710		450		1,430		548		11,500
WWTP	**SW305**	**13 Mar 2023**	**0089_QC214_230313**	**Interlab Duplicate**	**972487**																	
WWTP	**SW305**	**13 Mar 2023**	**0089_SW305_230313**	**Normal**	**EP2303086**	<1	126	<1	126	616	650	19,700	2.70	2,760		447		1,430		549		11,400
WWTP	**SW305**	**07 Jun 2023**	**0089_SW305_230607**	**Normal**	**EP2307502**	<1	143	<1	143	596	635	19,100	3.16	2,610		517		1,310		382		11,300
WWTP	**SW305**	**05 Sep 2023**	**0089_SW305_230905**	**Normal**	**EP2312178**	<1	158	<1	158	542	582	17,400	3.57	2,310		407		1,290		472		10,200
HSF	**SW309**	**18 Apr 2018**	**0089_SW309_180418**	**Normal**	**209573**																	
HSF	**SW309**	**10 Jan 2020**	**0089_QC101_200110**	**Field Duplicate**	**EP2000292**	<1	112	<1	113	602	721	19,100	9.00	2,910		526		1,590		605		12,600
HSF	**SW309**	**10 Jan 2020**	**0089_QC201_200110**	**Interlab Duplicate**	**696578**	<10	97					21,000			470		1,400		460		12,000	
HSF	**SW309**	**10 Jan 2020**	**0089_SW309_200110**	**Normal**	**EP2000292**	7	110	<1	117	583	701	18,600	9.18	2,700		520		1,570		596		12,200
HSF	**SW309**	**31 Mar 2020**	**0089_SW309_200331**	**Normal**	**EP2003369**	<1	115	<1	115	607	702	19,400	7.24	2,750		511		1,660		684		12,000
HSF	**SW309**	**22 Jul 2020**	**0089_SW309_200722**	**Normal**	**EP2007649**	<1	120	<1	120	588	666	18,700	6.25	2,800		449		1,430		517		11,800
HSF	**SW309**	**23 Sep 2020**	**0089_SW309_200923**	**Normal**	**EP2010222**	<1	119	<1	119	630	678	20,200	3.60	2,800		490		1,550		652		11,700

Table 3 - Surface water Analytical Results

						Inorganics									Metals								
						Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																						
PFAS NEMP 2020 Freshwater 99%																						
PFAS NEMP 2020 Recreational Water																						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
HSF	**SW309**	**15 Dec 2020**	**0089_QC112_201215**	**Field Duplicate**	**EP2014048**	<1	134	<1	134	632	682	20,200	3.83	2,840		494		1,540		674		11,800
HSF	**SW309**	**15 Dec 2020**	**0089_QC212_201115**	**Interlab Duplicate**	**765054**	<10	150	<20	150			21,000			570		1,700		540		9,900	
HSF	**SW309**	**15 Dec 2020**	**0089_SW309_201215**	**Normal**	**EP2014048**	<1	140	<1	140	626	693	20,000	5.06	2,860		504		1,560		693		12,000
HSF	**SW309**	**17 Mar 2021**	**0089_SW309_210317**	**Normal**	**EP2102892**	<1	109	<1	109	631	565	20,200	5.55	2,850		402		1,240		528		9,870
HSF	**SW309**	**09 Jun 2021**	**0089_SW309_210609**	**Normal**	**EP2106519**	<1	114	<1	114	590	668	18,900	6.15	2,630		470		1,500		630		11,600
HSF	**SW309**	**31 Aug 2021**	**0089_QC114_210831**	**Field Duplicate**	**EP2110065**	<1	117	<1	117	556	574	17,800	1.60	2,460		399		1,300		516		9,970
HSF	**SW309**	**31 Aug 2021**	**0089_QC214_210831**	**Interlab Duplicate**	**821197**																	
HSF	**SW309**	**31 Aug 2021**	**0089_SW309_210831**	**Normal**	**EP2110065**	<1	117	<1	117	555	579	17,800	2.12	2,450		400		1,300		517		10,100
HSF	**SW309**	**13 Jan 2022**	**0089_SW309_220113**	**Normal**	**EP2200338**	<1	115	<1	115	614	656	19,800	3.31	2,570		433		1,460		563		11,500
HSF	**SW309**	**16 Mar 2022**	**0089_SW309_220316**	**Normal**	**EP2203058**	<1	123	<1	123	597	647	19,100	4.04	2,680		452		1,480		615		11,200
HSF	**SW309**	**07 Jun 2022**	**0089_SW309_220607**	**Normal**	**EP2206887**	<1	123	<1	123	531	616	16,900	7.44	2,480		445		1,440		560		10,600
HSF	**SW309**	**06 Sep 2022**	**0089_SW309_220906**	**Normal**	**EP2211401**	<1	118	<1	118	573	619	18,300	3.88	2,620		432		1,400		500		10,800
HSF	**SW309**	**13 Dec 2022**	**0089_SW309_221213**	**Normal**	**EP2217375**	<1	117	<1	117	694	649	22,300	3.35	2,990		447		1,410		567		11,400
HSF	**SW309**	**14 Mar 2023**	**0089_SW309_230314**	**Normal**	**EP2303175**	<1	121	<1	121	627	654	20,100	2.14	2,750		446		1,430		545		11,500
HSF	**SW309**	**08 Jun 2023**	**0089_SW309_230608**	**Normal**	**EP2307590**	<1	118	<1	118	587	609	18,900	1.84	2,470		475		1,280		398		10,800
HSF	**SW309**	**04 Sep 2023**	**0089_SW309_230904**	**Normal**	**EP2312228**	<1	126	<1	126	585	658	18,600	5.82	2,790		446		1,470		554		11,500
HSF	**SW310**	**30 Apr 2018**	**0089_SW310_180430**	**Normal**	**209959**																	
HSF	**SW310**	**10 Jan 2020**	**0089_SW310_200110**	**Normal**	**EP2000292**	<1	118	<1	118	602	734	19,100	9.89	2,920		548		1,630		620		12,800
HSF	**SW310**	**31 Mar 2020**	**0089_SW310_200331**	**Normal**	**EP2003369**	<1	116	<1	116	586	669	18,600	6.69	2,810		479		1,550		696		11,500
HSF	**SW310**	**22 Jul 2020**	**0089_SW310_200722**	**Normal**	**EP2007649**	<1	122	<1	122	579	656	18,500	6.20	2,630		439		1,410		510		11,600
HSF	**SW310**	**23 Sep 2020**	**0089_SW310_200923**	**Normal**	**EP2010222**	<1	122	<1	122	627	648	20,100	1.67	2,780		470		1,480		631		11,200
HSF	**SW310**	**15 Dec 2020**	**0089_SW310_201215**	**Normal**	**EP2014048**	<1	119	<1	119	626	683	20,000	4.33	2,870		496		1,550		679		11,800
HSF	**SW310**	**17 Mar 2021**	**0089_SW310_210317**	**Normal**	**EP2102890**	<1	108	<1	108	601	712	19,200	8.52	2,730		505		1,580		700		12,400
HSF	**SW310**	**09 Jun 2021**	**0089_SW310_210609**	**Normal**	**EP2106519**	<1	115	<1	115	578	657	18,500	6.40	2,570		466		1,480		618		11,400
HSF	**SW310**	**31 Aug 2021**	**0089_SW310_210831**	**Normal**	**EP2110065**	<1	116	<1	116	561	586	18,000	2.18	2,440		406		1,320		522		10,200
HSF	**SW310**	**13 Jan 2022**	**0089_SW310_220113**	**Normal**	**EP2200338**	<1	120	<1	120	625	674	20,200	3.75	2,540		447		1,500		579		11,800
HSF	**SW310**	**16 Mar 2022**	**0089_SW310_220316**	**Normal**	**EP2203058**	<1	122	<1	122	602	660	19,200	4.57	2,810		461		1,520		639		11,400
HSF	**SW310**	**07 Jun 2022**	**0089_QC103_220607**	**Field Duplicate**	**EP2206887**																	
HSF	**SW310**	**07 Jun 2022**	**0089_QC203_220607**	**Interlab Duplicate**	**896805**																	
HSF	**SW310**	**07 Jun 2022**	**0089_SW310_220607**	**Normal**	**EP2206887**	<1	122	<1	122	536	616	17,100	6.94	2,460		444		1,440		559		10,600
HSF	**SW310**	**06 Sep 2022**	**0089_SW310_220906**	**Normal**	**EP2211401**	<1	118	<1	118	632	606	20,400	2.07	2,600		421		1,360		483		10,600
HSF	**SW310**	**13 Dec 2022**	**0089_SW310_221213**	**Normal**	**EP2216930**	<1	120	<1	120	626	666	20,200	3.13	2,560		455		1,450		586		11,700
HSF	**SW310**	**14 Mar 2023**	**0089_SW310_230314**	**Normal**	**EP2303175**	<1	166	<1	166	623	660	19,900	2.86	2,810		452		1,440		557		11,600
HSF	**SW310**	**08 Jun 2023**	**0089_SW310_230608**	**Normal**	**EP2307590**	<1	118	<1	118	584	632	18,800	3.95	2,480		495		1,340		401		11,200
HSF	**SW310**	**04 Sep 2023**	**0089_SW310_230904**	**Normal**	**EP2312228**	<1	126	<1	126	554	628	17,700	6.30	2,490		444		1,430		555		10,900
HSF	**SW311**	**30 Apr 2018**	**0089_SW311_180430**	**Normal**	**209959**																	
HSF	**SW311**	**01 Apr 2020**	**0089_SW311_200401**	**Normal**	**EP2003418**	<1	116	<1	116	592	695	18,800	8.02	2,840		486		1,580		734		12,000
HSF	**SW311**	**22 Jul 2020**	**0089_SW311_200722**	**Normal**	**EP2007649**	<1	121	<1	121	577	649	18,400	5.86	2,680		436		1,390		501		11,500
HSF	**SW311**	**23 Sep 2020**	**0089_SW311_200923**	**Normal**	**EP2010222**	<1	120	<1	120	634	704	20,300	5.25	2,840		495		1,600		680		12,200
HSF	**SW311**	**15 Dec 2020**	**0089_SW311_201215**	**Normal**	**EP2014053**	<1	119	<1	119	633	704	20,100	5.37	3,040		508		1,590		687		12,200
HSF	**SW311**	**17 Mar 2021**	**0089_SW311_210317**	**Normal**	**EP2102892**	<1	112	<1	112	623	612	19,800	0.86	2,970		433		1,340		575		10,700
HSF	**SW311**	**09 Jun 2021**	**0089_SW311_210609**	**Normal**	**EP2106519**	<1	113	<1	113	572	668	18,300	7.70	2,590		474		1,500		632		11,600
HSF	**SW311**	**31 Aug 2021**	**0089_SW311_210831**	**Normal**	**EP2110072**	<1	117	<1	117	548	619	17,600	6.04	2,390		430		1,380		559		10,800
HSF	**SW311**	**13 Jan 2022**	**0089_SW311_220113**	**Normal**	**EP2200338**	<1	122	<1	122	614	667	19,800	4.16	2,550		441		1,480		574		11,700
HSF	**SW311**	**16 Mar 2022**	**0089_SW311_220316**	**Normal**	**EP2203058**	<1	123	<1	123	582	648	18,500	5.35	2,760		452		1,480		626		11,200
HSF	**SW311**	**07 Jun 2022**	**0089_SW311_220607**	**Normal**	**EP2206887**	<1	116	<1	116	551	605	17,600	4.68	2,520		439		1,420		555		10,400
HSF	**SW311**	**06 Sep 2022**	**0089_SW311_220906**	**Normal**	**EP2211401**	<1	118	<1	118	583	636	18,600	4.35	2,670		444		1,430		506		11,100
HSF	**SW311**	**13 Dec 2022**	**0089_SW311_221213**	**Normal**	**EP2216930**	<1	118	<1	118	626	636	20,200	0.73	2,600		428		1,370		556		11,200
HSF	**SW311**	**14 Mar 2023**	**0089_SW311_230314**	**Normal**	**EP2303175**	<1	122	<1	122	630	649	20,200	1.45	2,780		442		1,420		542		11,400
HSF	**SW311**	**08 Jun 2023**	**0089_SW311_230608**	**Normal**	**EP2307590**	<1	119	<1	119	578	580	18,700	0.23	2,300		449		1,220		377		10,300
HSF	**SW311**	**04 Sep 2023**	**0089_SW311_230904**	**Normal**	**EP2312228**	<1	125	<1	125	558	628	17,900	5.87	2,450		443		1,430		554		10,900
Dredge spoil and Careening Bay	**SW317**	**17 Apr 2018**	**0089_SW317_180417**	**Normal**	**209522**																	
	SW317	**08 Jan 2020**	**0089_SW317_200108**	**Normal**	**EP2000183**	<1	119	<1	119	590	664	18,900	5.86	2,640		456		1,490		552		11,600
	SW317	**10 Jan 2020**	**0089_SW317_200110**	**Normal**	**EP2000292**	<1	117	<1	117	584	714	18,600	10.0	2,760		464		1,610		584		12,500
	SW317	**30 Mar 2020**	**0089_SW317_200330**	**Normal**	**EP2003314**	<1	117	<1	117	601	678	19,200	6.01	2,730		508		1,590		658		11,600
	SW317	**21 Jul 2020**	**0089_SW317_200721**	**Normal**	**EP2007604**	<1	120	<1	120	576	686	18,300	8.74	2,750		539		1,500		715		11,900
	SW317	**21 Sep 2020**	**0089_SW317_200921**	**Normal**	**EP2010083**	<1	128	<1	128	545	691	17,200	11.8	2,740		483		1,550		664		12,000
	SW317	**14 Dec 2020**	**0089_SW317_201214**	**Normal**	**EP2013989**	<1	118	<1	118	630	724	20,000	6.98	3,040		506		1,620		694		12,600
	SW317	**15 Mar 2021**	**0089_SW317_210315**	**Normal**	**EP2102758**	<1	111	<1	111	636	637	20,400	0.11	2,790		404		1,270		648		11,400
	SW317	**10 Jun 2021**	**0089_SW317_210610**	**Normal**	**EP2106582**	<1	113	<1	113	573	662	18,300	7.26	2,610		461		1,500		621		11,500
	SW317	**31 Aug 2021**	**0089_SW317_210831**	**Normal**	**EP2110068**	<1	121	<1	121	548	627	17,600	6.73	2,350		454		1,400		582		10,900
	SW317	**13 Jan 2022**	**0089_SW317_220113**	**Normal**	**EP2200343**	<1	122	<1	122	607	712	19,900	7.97	2,060		466		1,570		608		12,500
	SW317	**16 Mar 2022**	**0089_SW317_220316**	**Normal**	**EP2203058**	<1	123	<1	123	616	665	19,800	3.78	2,660		463		1,520		638		11,500
	SW317	**09 Jun 2022**	**0089_SW317_220609**	**Normal**	**EP2207029**	<1	123	<1	123	554	671	17,700	9.49	2,530		484		1,580		635		11,500
	SW317	**06 Sep 2022**	**0089_SW317_220906**	**Normal**	**EP2211391**	<1	117	<1	117	544	606	17,400	5.38	2,470		422		1,360		488		10,600
	SW317	**13 Dec 2022**	**0089_SW317_221213**	**Normal**	**EP2216934**	<1	120	<1	120	650	648	21,100	0.14	2,530		438		1,410		572		11,400
	SW317	**14 Mar 2023**	**0089_SW317_230314**	**Normal**	**EP2303179**	<1	125	<1	125	615	652	19,700	2.86	2,750		436		1,410		538		11,500
	SW317	**06 Jun 2023**	**0089_SW317_230606**	**Normal**	**EP2307434**	<1	118	<1	118	640	714	20,500	5.43	2,860		426		1,340		482		13,100
	SW317	**04 Sep 2023**	**0089_QC101_230904**	**Field Duplicate**	**EP2312228**																	
	SW317	**04 Sep 2023**	**0089_QC201_230904**	**Interlab Duplicate**	**1023399**																	
	SW317	**04 Sep 2023**	**0089_SW317_230904**	**Normal**	**EP2312228**	<1	131	<1	131	561	635	17,900	6.25	2,550		438		1,420		543		11,100
Dredge spoil and Careening Bay	**SW318**	**18 Apr 2018**	**0089_SW318_180418**	**Normal**	**209573**																	
	SW318	**08 Jan 2020**	**0089_SW318_200108**	**Normal**	**EP2000183**	<1	125	<1	125	610	669	19,400	4.63	2,870		461		1,490		553		11,700
	SW318	**30 Mar 2020**	**0089_QC103_200330**	**Field Duplicate**	**EP2003314**	<1	117	<1	117	592	713	18,900	9.24	2,730		539		1,670		703		12,200
	SW318	**30 Mar 2020**	**0089_QC203_200330**	**Interlab Duplicate**	**711144**	<20	120	<20	120			30,000			450		1,400		480		11,000	
	SW318	**30 Mar 2020**	**0089_SW318_200330**	**Normal**	**EP2003314**	<1	118	<1	118	590	714	18,800	9.54	2,730		502		1,600		694		12,400
	SW318	**21 Jul 2020**	**0089_SW318_200721**	**Normal**	**EP2007604**	<1	124	<1	124	569	661	18,100	7.46	2,710		467		1,480		624		11,500
	SW318	**21 Sep 2020**	**0089_SW318_200921**	**Normal**	**EP2010083**	<1	136	<1	136	548	680	17,200	10.8	2,870		490		1,520		658		11,800
	SW318	**14 Dec 2020**	**0089_SW318_201214**	**Normal**	**EP2013989**	<1	123	<1	123	631	726	20,100	7.04	2,940		510		1,640		694		12,600
	SW318	**15 Mar 2021**	**0089_SW318_210315**	**Normal**	**EP2102758**	<1	111	<1	111	589	709	18,700	9.18	2,870		485		1,560		653		12,400
	SW318	**10 Jun 2021**	**0089_SW318_210610**	**Normal**	**EP2106582**	<1	114	<1	114	581	668	18,600	6.97	2,600		467		1,510		628		11,600
	SW318	**31 Aug 2021**	**0089_SW318_210831**	**Normal**	**EP2110068**	<1	122	<1	122	551	599	17,600	4.22	2,490		435		1,350		551		10,400
	SW318	**13 Jan 2022**	**0089_SW318_220113**	**Normal**	**EP2200343**	<1	125	<1	125	611	672	19,800	4.74	2,400		445		1,480		569		11,800
	SW318	**16 Mar 2022**	**0089_SW318_220316**	**Normal**	**EP2203058**	<1	122	<1	122	621	676	20,000	4.20	2,620		470		1,540		643		11,700
	SW318	**09 Jun 2022**	**0089_SW318_220609**	**Normal**	**EP2207029**	<1	124	<1	124	548	635	17,500	7.34	2,500		459		1,490		599		10,900
	SW318	**06 Sep 2022**	**0089_SW318_220906**	**Normal**	**EP2211391**	<1	120	<1	120	550	612	17,600	5.31	2,460		422		1,370		491		10,700
	SW318	**13 Dec 2022**	**0089_SW318_221213**	**Normal**	**EP2216934**	<1	122	<1	122	636	705	20,600	5.18	2,510		477		1,530		634		12,400
	SW318	**14 Mar 2023**	**0089_SW318_230314**	**Normal**	**EP2303179**	<1	124	<1	124	617	642	19,800	1.94	2,710		431		1,400		534		11,300
	SW318	**06 Jun 2023**	**0089_SW318_230606**	**Normal**	**EP2307434**	<1	127	<1	127	640	735	20,700	6.84	2,600		444		1,370		493		13,500
	SW318	**04 Sep 2023**	**0089_SW318_230904**	**Normal**	**EP2312228**	<1	130	<1	130	577	625	18,500	4.04	2,520		434		1,410		533		10,900
	SW319	**18 Apr 2018**	**0089_SW319_180418**	**Normal**	**209573**																	
	SW319	**08 Jan 2020**	**0089_SW319_200108**	**Normal**	**EP2000183**	<1	117	<1	117	583	690	18,600	8.41	2,700		473		1,530		565		12,100
	SW319	**30 Mar 2020**	**0089_QC104_200330**	**Field Duplicate**	**EP2003314**	<1	116	<1	116	590	729	18,800	10.6	2,750		508		1,620		710		12,700
	SW319	**30 Mar 2020**	**0089_QC204_200330**	**Interlab Duplicate**	**711144**	<20	120	<20	120			25,000			500		1,500		530		12,000	
	SW319	**30 Mar 2020**	**0089_SW319_200330**	**Normal**	**EP2003314**	<1	116	<1	116	615	744	19,700	9.48	2,750		549		1,720		720		12,800
	SW319	**21 Jul 2020**	**0089_SW319_200721**	**Normal**	**EP2007604**	<1	128	<1	128	572	634	18,200	5.14	2,670		497		1,380		652		11,000
	SW319	**21 Sep 2020**	**0089_QC104_200921**	**Field Duplicate**	**EP2010083**	<1	125	<1	125	540	651	17,000	9.32	2,780		422		1,490		613		11,300
	SW319	**21 Sep 2020**	**0089_QC204_200921**	**Interlab Duplicate**	**746269**	<10	110	<20	110			18,000			460		1,400		420		10,000	
	SW319	**21 Sep 2020**	**0089_SW319_200921**	**Normal**	**EP2010083**	<1	123	<1	123	552	692	17,400	11.3	2,810		454		1,590		654		12,000
	SW319	**14 Dec 2020**	**0089_QC111_201214**	**Field Duplicate**	**EP2013989**	<1	118	<1	118	636	743	20,300	7.72	2,950		523		1,670		715		12,900

Table 3 - Surface water Analytical Results

						Inorganics									Metals								
						Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																						
PFAS NEMP 2020 Freshwater 99%																						
PFAS NEMP 2020 Recreational Water																						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
Dredge spoil and Careening Bay	SW319	14 Dec 2020	0089_QC211_201114	Interlab Duplicate	765054	<10	150	<20	150			20,000			500		1,500		470		12,000	
	SW319	14 Dec 2020	0089_SW319_201214	Normal	EP2013989	<1	161	<1	161	641	737	20,400	7.00	2,990		520		1,660		706		12,800
	SW319	15 Mar 2021	0089_QC107_210315	Field Duplicate	EP2102758	<1	113	<1	113	583	708	18,500	9.69	2,820		488		1,550		649		12,400
	SW319	15 Mar 2021	0089_QC207_210315	Interlab Duplicate	781350	<10	130					19,000			450		1,400		470		12,000	
	SW319	15 Mar 2021	0089_SW319_210315	Normal	EP2102758	<1	111	<1	111	642	659	20,600	1.35	2,800		432		1,300		677		11,800
	SW319	10 Jun 2021	0089_SW319_210610	Normal	EP2106582	<1	115	<1	115	581	669	18,600	7.03	2,600		468		1,520		626		11,600
	SW319	31 Aug 2021	0089_SW319_210831	Normal	EP2110068	<1	119	<1	119	549	581	17,600	2.83	2,410		420		1,300		536		10,100
	SW319	13 Jan 2022	0089_SW319_220113	Normal	EP2200343	<1	122	<1	122	620	669	20,000	3.84	2,550		452		1,500		559		11,700
	SW319	16 Mar 2022	0089_SW319_220316	Normal	EP2203058	<1	123	<1	123	622	629	20,000	0.51	2,680		436		1,430		598		10,900
	SW319	09 Jun 2022	0089_SW319_220609	Normal	EP2207029	<1	122	<1	122	564	625	17,900	5.13	2,720		453		1,480		593		10,700
	SW319	06 Sep 2022	0089_SW319_220906	Normal	EP2211391	<1	120	<1	120	556	618	17,800	5.27	2,480		426		1,390		494		10,800
	SW319	13 Dec 2022	0089_SW319_221213	Normal	EP2216934	<1	123	<1	123	633	669	20,500	2.73	2,530		443		1,440		592		11,800
	SW319	14 Mar 2023	0089_SW319_230314	Normal	EP2303179	<1	126	<1	126	620	637	19,900	1.36	2,710		429		1,400		533		11,200
	SW319	06 Jun 2023	0089_QC105_230606	Field Duplicate	EP2307434																	
	SW319	06 Jun 2023	0089_QC205_230606	Interlab Duplicate	997465																	
	SW319	06 Jun 2023	0089_SW319_230606	Normal	EP2307434	<1	122	<1	122	638	708	20,400	5.21	2,890		424		1,330		475		13,000
	SW319	04 Sep 2023	0089_SW319_230904	Normal	EP2312228	<1	131	<1	131	572	652	18,300	6.62	2,530		448		1,460		552		11,400
WWTP	SW353	19 Apr 2018	0089_SW353_180419	Normal	209623																	
WWTP	SW353	30 Jan 2020	0089_SW353_200130	Normal	EP2001004	<1	118	<1	118	625	684	20,000	4.52	2,810		473		1,510		560		12,000
WWTP	SW353	02 Apr 2020	0089_SW353_200402	Normal	EP2003473	<1	117	<1	117	586	675	18,600	7.05	2,840		491		1,550		722		11,600
WWTP	SW353	21 Jul 2020	0089_SW353_200721	Normal	EP2007595	<1	123	<1	123	578	667	18,400	7.08	2,740		471		1,490		627		11,600
WWTP	SW353	23 Sep 2020	0089_SW353_200923	Normal	EP2010222	<1	122	<1	122	629	722	20,100	6.92	2,850		515		1,640		698		12,500
WWTP	SW353	16 Dec 2020	0089_SW353_201216	Normal	EP2014090	<1	121	<1	121	625	655	20,000	2.32	2,810		480		1,500		621		11,300
WWTP	SW353	17 Mar 2021	0089_SW353_210317	Normal	EP2102901	<1	112	<1	112	637	673	20,400	2.75	2,850		474		1,500		667		11,700
WWTP	SW353	08 Jun 2021	0089_SW353_210608	Normal	EP2106450	<1	104	<1	104	565	665	17,900	8.10	2,800		458		1,480		618		11,600
WWTP	SW353	30 Aug 2021	0089_SW353_210830	Normal	EP2110017	<1	116	<1	116	550	588	17,600	3.40	2,450		424		1,320		586		10,200
WWTP	SW353	11 Jan 2022	0089_SW353_220111	Normal	EP2200240	<1	121	<1	121	611	631	19,700	1.59	2,560		424		1,390		500		11,100
WWTP	SW353	14 Mar 2022	0089_SW353_220314	Normal	EP2202980	<1	120	<1	120	580	635	18,500	4.48	2,700		448		1,450		580		11,000
WWTP	SW353	07 Jun 2022	0089_SW353_220607	Normal	EP2206884	<1	125	<1	125	528	642	16,800	9.78	2,470		490		1,500		624		11,000
WWTP	SW353	07 Sep 2022	0089_SW353_220907	Normal	EP2211496	<1	120	<1	120	521	635	16,600	9.86	2,430		442		1,430		500		11,100
WWTP	SW353	12 Dec 2022	0089_SW353_221212	Normal	EP2216877	<1	127	<1	127	656	620	21,200	2.82	2,640		416		1,350		533		10,900
WWTP	SW353	15 Mar 2023	0089_SW353_230315	Normal	EP2303229	<1	122	<1	122	619	669	19,800	3.84	2,800		446		1,450		544		11,800
WWTP	SW353	07 Jun 2023	0089_SW353_230607	Normal	EP2307493	<1	118	<1	118	613	659	19,600	3.62	2,780		415		1,170		452		12,200
WWTP	SW353	05 Sep 2023	0089_SW353_230905	Normal	EP2312188	<1	124	<1	124	572	643	18,400	5.77	2,450		428		1,420		505		11,300
WWTP	SW370	17 Apr 2018	0089_SW370_180417	Normal	209522																	
WWTP	SW370	09 Jan 2020	0089_SW370_200109	Normal	EP2000249	2	126	<1	128	607	729	19,400	9.10	2,750		516		1,650		746		12,600
WWTP	SW370	31 Mar 2020	0089_SW370_200331	Normal	EP2003372	<1	122	<1	122	585	680	18,600	7.53	2,780		487		1,570		700		11,700
WWTP	SW370	15 Jul 2020	0089_SW370_200715	Normal	EP2007383	<1	130	<1	130	595	716	19,000	9.26	2,710		506		1,540		642		12,600
WWTP	SW370	24 Sep 2020	0089_SW370_200924	Normal	EP2010274	<1	150	<1	150	609	684	19,400	5.81	2,830		470		1,490		634		12,000
WWTP	SW370	15 Dec 2020	0089_SW370_201215	Normal	EP2014053	<1	147	<1	147	624	744	19,800	8.81	2,990		544		1,670		726		12,900
WWTP	SW370	16 Mar 2021	0089_SW370_210316	Normal	EP2102834	<1	119	<1	119	637	671	20,400	2.62	2,840		474		1,490		626		11,700
WWTP	SW370	09 Jun 2021	0089_SW370_210609	Normal	EP2106517	<1	166	<1	166	580	670	18,500	7.19	2,620		480		1,520		624		11,600
WWTP	SW370	01 Sep 2021	0089_SW370_210901	Normal	EP2110154	<1	122	<1	122	546	626	17,600	6.84	2,250		440		1,400		572		10,900
WWTP	SW370	10 Jan 2022	0089_SW370_220110	Normal	EP2200215	<1	128	<1	128	609	591	19,600	1.53	2,580		421		1,260		535		10,400
WWTP	SW370	14 Mar 2022	0089_SW370_220314	Normal	EP2202977	<1	124	<1	124	640	685	20,600	3.42	2,700		475		1,550		632		11,900
WWTP	SW370	07 Jun 2022	0089_SW370_220607	Normal	EP2206884	<1	126	<1	126	565	582	18,100	1.54	2,480		444		1,350		555		10,000
WWTP	SW370	05 Sep 2022	0089_SW370_220905	Normal	EP2211341	<1	123	<1	123	566	604	18,100	3.28	2,520		416		1,350		598		10,500
WWTP	SW370	12 Dec 2022	0089_SW370_221212	Normal	EP2216877	<1	148	<1	148	649	667	20,900	1.36	2,720		464		1,460		582		11,700
WWTP	SW370	14 Mar 2023	0089_SW370_230314	Normal	EP2303175	<1	145	<1	145	618	667	19,900	3.74	2,610		468		1,460		556		11,700
WWTP	SW370	07 Jun 2023	0089_QC112_230607	Field Duplicate	EP2307493																	
WWTP	SW370	07 Jun 2023	0089_QC212_230607	Interlab Duplicate	997465																	
WWTP	SW370	07 Jun 2023	0089_SW370_230607	Normal	EP2307493	<1	125	<1	125	616	706	19,800	6.79	2,660		437		1,300		468		13,000
WWTP	SW370	05 Sep 2023	0089_SW370_230905	Normal	EP2312172	<1	138	<1	138	605	616	19,500	0.90	2,510		421		1,370		489		10,800
WWTP	SW371	17 Apr 2018	0089_SW371_180417	Normal	209522																	
WWTP	SW371	08 Jan 2020	0089_SW371_200108	Normal	EP2000183	<1	113	<1	113	591	683	18,700	7.24	2,930		467		1,500		559		12,000
WWTP	SW371	01 Apr 2020	0089_SW371_200401	Normal	EP2003414	<1	130	<1	130	576	652	18,300	6.18	2,770		464		1,510		700		11,200
WWTP	SW371	20 Jul 2020	0089_SW371_200720	Normal	EP2007545	<1	127	<1	127	575	651	18,400	6.20	2,550		451		1,430		571		11,400
WWTP	SW371	22 Sep 2020	0089_SW371_200922	Normal	EP2010145	<1	149	<1	149	588	546	18,800	3.71	2,650		398		1,240		524		9,450
WWTP	SW371	15 Dec 2020	0089_SW371_201215	Normal	EP2014048	<1	140	<1	140	608	682	19,400	5.78	2,770		501		1,540		677		11,800
WWTP	SW371	15 Mar 2021	0089_QC103_210315	Field Duplicate	EP2102758	<1	119	<1	119	639	632	20,500	0.50	2,790		390		1,270		658		11,300
WWTP	SW371	15 Mar 2021	0089_QC203_210315	Interlab Duplicate	781350	<10	140					19,000			560		1,500		450		12,000	
WWTP	SW371	15 Mar 2021	0089_SW371_210315	Normal	EP2102758	<1	186	<1	186	644	655	20,600	0.86	2,820		409		1,320		657		11,700
WWTP	SW371	10 Jun 2021	0089_SW371_210610	Normal	EP2106590	<1	129	<1	129	566	647	18,000	6.70	2,670		472		1,460		636		11,200
WWTP	SW371	01 Sep 2021	0089_SW371_210901	Normal	EP2110154	<1	119	<1	119	545	620	17,600	6.45	2,220		433		1,390		567		10,800
WWTP	SW371	11 Jan 2022	0089_SW371_220111	Normal	EP2200240	<1	127	<1	127	592	637	19,000	3.68	2,550		430		1,400		505		11,200
WWTP	SW371	18 Mar 2022	0089_SW371_220318	Normal	EP2203195	<1	128	<1	128	598	638	19,100	3.28	2,710		462		1,440		544		11,100
WWTP	SW371	08 Jun 2022	0089_SW371_220608	Normal	EP2206973	<1	132	<1	132	602	659	19,200	4.50	2,780		477		1,550		624		11,300
WWTP	SW371	05 Sep 2022	0089_SW371_220905	Normal	EP2211344	<1	169	<1	169	548	561	17,500	1.21	2,430		400		1,260		555		9,730
WWTP	SW371	12 Dec 2022	0089_SW371_221212	Normal	EP2216879	<1	143	<1	143	728	658	22,600	5.07	4,210		446		1,430		516		11,600
WWTP	SW371	13 Mar 2023	0089_SW371_230313	Normal	EP2303086	<1	124	<1	124	636	654	20,400	1.33	2,810		449		1,420		550		11,500
WWTP	SW371	07 Jun 2023	0089_SW371_230607	Normal	EP2307502	<1	131	<1	131	594	575	19,000	1.66	2,670		464		1,200		360		10,200
WWTP	SW371	05 Sep 2023	0089_SW371_230905	Normal	EP2312178	<1	143	<1	143	523	614	16,600	8.02	2,480		414		1,350		483		10,800
WWTP	SW372	13 Apr 2018	0089_SW372_180413	Normal	209417																	
WWTP	SW372	08 Jan 2020	0089_SW372_200108	Normal	EP2000183	<1	124	<1	124	593	713	18,900	9.17	2,760		487		1,580		580		12,500
WWTP	SW372	31 Mar 2020	0089_SW372_200331	Normal	EP2003372	<1	118	<1	118	588	709	18,700	9.30	2,800		508		1,630		730		12,200
WWTP	SW372	20 Jul 2020	0089_SW372_200720	Normal	EP2007545	<1	129	<1	129	588	686	18,800	7.73	2,630		487		1,510		610		12,000
WWTP	SW372	22 Sep 2020	0089_SW372_200922	Normal	EP2010145	<1	140	<1	140	589	576	18,800	1.04	2,670		418		1,310		556		9,970
WWTP	SW372	15 Dec 2020	0089_SW372_201215	Normal	EP2014044	<1	104	<1	104	524	567	16,600	3.89	2,590		395		1,270		514		9,870
WWTP	SW372	17 Mar 2021	0089_SW372_210317	Normal	EP2102901	<1	113	<1	113	657	739	21,000	5.89	2,990		537		1,660		741		12,800
WWTP	SW372	10 Jun 2021	0089_SW372_210610	Normal	EP2106590	<1	162	<1	162	566	677	18,100	8.95	2,490		496		1,530		675		11,700
WWTP	SW372	01 Sep 2021	0089_SW372_210901	Normal	EP2110154	<1	120	<1	120	542	628	17,500	7.33	2,220		445		1,420		580		10,900
WWTP	SW372	12 Jan 2022	0089_QC116_220112	Field Duplicate	EP2200289	<1	123	<1	124	604	652	19,200	3.78	2,880								
WWTP	SW372	12 Jan 2022	0089_QC216_220112	Interlab Duplicate	855202																	
WWTP	SW372	12 Jan 2022	0089_SW372_220112	Normal	EP2200289	<1	120	<1	120	610	718	19,600	8.17	2,610		515		1,570		594		12,600
WWTP	SW372	18 Mar 2022	0089_SW372_220318	Normal	EP2203195	<1	127	<1	127	609	650	19,500	3.29	2,700		474		1,470		550		11,300
WWTP	SW372	08 Jun 2022	0089_SW372_220608	Normal	EP2206973	<1	121	<1	121	596	671	18,900	5.90	2,900		483		1,580		636		11,500
WWTP	SW372	06 Sep 2022	0089_SW372_220906	Normal	EP2211391	<1	128	<1	128	544	578	17,400	3.09	2,420		406		1,300		465		10,100
WWTP	SW372	12 Dec 2022	0089_SW372_221212	Normal	EP2216879	<1	152	<1	152	621	654	20,000	2.60	2,580		455		1,420		560		11,500
WWTP	SW372	14 Mar 2023	0089_SW372_230314	Normal	EP2303179	<1	124	<1	124	624	647	20,000	1.86	2,740		435		1,410		538		11,400
WWTP	SW372	07 Jun 2023	0089_SW372_230607	Normal	EP2307502	<1	138	<1	138	588	602	18,800	1.16	2,650		473		1,260		367		10,700
WWTP	SW372	05 Sep 2023	0089_SW372_230905	Normal	EP2312178	<1	154	<1	154	551	580	17,700	2.50	2,350		406		1,300		509		10,100
WWTP	SW373	13 Apr 2018	0089_SW373_180413	Normal	209417																	
WWTP	SW373	08 Jan 2020	0089_SW373_200108	Normal	EP2000183	10	111	<1	121	583	669	18,600	6.87	2,680		466		1,490		551		11,700
WWTP	SW373	31 Mar 2020	0089_SW373_200331	Normal	EP2003372	<1	117	<1	117	610	711	19,500	7.67	2,760		504		1,620		691		12,300
WWTP	SW373	20 Jul 2020	0089_SW373_200720	Normal	EP2007545	<1	124	<1	124	591	691	18,900	7.81	2,660		480		1,520		615		12,100
WWTP	SW373	22 Sep 2020	0089_SW373_200922	Normal	EP2010145	<1	144	<1	144	579	553	18,500	2.30	2,620		400		1,240		534		9,600
WWTP	SW373	15 Dec 2020	0089_SW373_201215	Normal	EP2014044	<1	92	<1	92	500	552	15,600	4.92	2,790		379		1,220		496		9,650
WWTP	SW373	17 Mar 2021	0089_SW373_210317	Normal	EP2102901	<1	112	<1	112	631	714	20,100	6.17	2,990		504		1,600		715		12,400
WWTP	SW373	10 Jun 2021	0089_SW373_210610	Normal	EP2106579	<1	151	<1	151	576	676	18,400	7.97	2,600		486		1,540		629		11,700
WWTP	SW373	30 Aug 2021	0089_SW373_210830	Normal	EP2110017	<1	134	<1	134	516	562	16,500	4.24	2,320		412		1,270		559		9,720

Table 3 - Surface water Analytical Results

						Inorganics									Metals								
						Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																						
PFAS NEMP 2020 Freshwater 99%																						
PFAS NEMP 2020 Recreational Water																						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
WWTP	**SW373**	**12 Jan 2022**	**0089_SW373_220112**	**Normal**	**EP2200289**	5	117	<1	122			19,500		2,650		484		1,490		562		11,800
WWTP	**SW373**	**18 Mar 2022**	**0089_SW373_220318**	**Normal**	**EP2203195**	<1	126	<1	126	594	575	18,900	1.65	2,800		420		1,310		495		9,960
WWTP	**SW373**	**08 Jun 2022**	**0089_SW373_220608**	**Normal**	**EP2206973**	<1	121	<1	121	592	664	18,800	5.72	2,860		478		1,560		627		11,400
WWTP	**SW373**	**06 Sep 2022**	**0089_SW373_220906**	**Normal**	**EP2211391**	<1	127	<1	127	549	613	17,500	5.53	2,530		430		1,380		497		10,700
WWTP	**SW373**	**12 Dec 2022**	**0089_SW373_221212**	**Normal**	**EP2216879**	<1	142	<1	142	726	659	22,600	4.79	4,100		444		1,450		518		11,600
WWTP	**SW373**	**14 Mar 2023**	**0089_QC116_230314**	**Field Duplicate**	**EP2303179**	<1	134	<1	134	609	659	19,500	3.94	2,690		450		1,430		546		11,600
WWTP	**SW373**	**14 Mar 2023**	**0089_QC216_230314**	**Interlab Duplicate**	**972487**																	
WWTP	**SW373**	**14 Mar 2023**	**0089_SW373_230314**	**Normal**	**EP2303179**	<1	136	<1	136	617	675	19,800	4.48	2,690		461		1,460		565		11,900
WWTP	**SW373**	**07 Jun 2023**	**0089_SW373_230607**	**Normal**	**EP2307502**	<1	157	<1	157	603	616	19,300	1.00	2,680		480		1,260		368		11,000
WWTP	**SW373**	**05 Sep 2023**	**0089_SW373_230905**	**Normal**	**EP2312178**	<1	133	<1	133	566	581	18,200	1.34	2,400		409		1,320		509		10,100
WWTP	**SW382**	**19 Apr 2018**	**0089_SW382_180419**	**Normal**	**209623**																	
WWTP	**SW382**	**30 Jan 2020**	**0089_SW382_200130**	**Normal**	**EP2001004**	<1	104	<1	104	622	683	19,900	4.67	2,830		474		1,500		559		12,000
WWTP	**SW382**	**02 Apr 2020**	**0089_SW382_200402**	**Normal**	**EP2003473**	<1	116	<1	116	637	730	20,400	6.81	2,850		512		1,670		749		12,600
WWTP	**SW382**	**21 Jul 2020**	**0089_SW382_200721**	**Normal**	**EP2007595**	<1	123	<1	123	568	655	18,000	7.12	2,760		460		1,460		616		11,400
WWTP	**SW382**	**23 Sep 2020**	**0089_SW382_200923**	**Normal**	**EP2010218**	<1	124	<1	124	613	670	19,600	4.45	2,760		475		1,520		647		11,600
WWTP	**SW382**	**16 Dec 2020**	**0089_SW382_201216**	**Normal**	**EP2014104**	<1	118	<1	118	626	716	20,000	6.71	2,840		504		1,620		698		12,400
WWTP	**SW382**	**17 Mar 2021**	**0089_SW382_210317**	**Normal**	**EP2102892**	<1	110	<1	110	634	547	20,200	7.29	2,960		392		1,210		506		9,550
WWTP	**SW382**	**08 Jun 2021**	**0089_SW382_210608**	**Normal**	**EP2106450**	<1	114	<1	114	568	669	18,000	8.15	2,810		458		1,480		619		11,700
WWTP	**SW382**	**30 Aug 2021**	**0089_SW382_210830**	**Normal**	**EP2110017**	<1	120	<1	120	550	600	17,600	4.34	2,480		434		1,350		600		10,400
WWTP	**SW382**	**11 Jan 2022**	**0089_SW382_220111**	**Normal**	**EP2200240**	<1	115	<1	115	615	637	19,800	1.75	2,590		429		1,400		505		11,200
WWTP	**SW382**	**14 Mar 2022**	**0089_SW382_220314**	**Normal**	**EP2202980**	<1	120	<1	120	581	685	18,600	8.20	2,600		476		1,550		628		11,900
WWTP	**SW382**	**07 Jun 2022**	**0089_SW382_220607**	**Normal**	**EP2206881**	<1	123	<1	123	558	568	17,900	0.90	2,440		458		1,310		567		9,730
WWTP	**SW382**	**07 Sep 2022**	**0089_SW382_220907**	**Normal**	**EP2211496**	<1	119	<1	119	531	634	16,900	8.86	2,490		435		1,420		502		11,100
WWTP	**SW382**	**12 Dec 2022**	**0089_SW382_221212**	**Normal**	**EP2216873**	5	118	<1	123	667	688	21,500	1.52	2,800		474		1,490		596		12,100
WWTP	**SW382**	**15 Mar 2023**	**0089_SW382_230315**	**Normal**	**EP2303229**	<1	121	<1	121	627	652	20,200	1.90	2,650		441		1,410		527		11,500
WWTP	**SW382**	**07 Jun 2023**	**0089_SW382_230607**	**Normal**	**EP2307493**	<1	117	<1	117	618	674	19,800	4.39	2,730		429		1,240		456		12,400
WWTP	**SW382**	**05 Sep 2023**	**0089_SW382_230905**	**Normal**	**EP2312188**	<1	124	<1	124	562	633	18,000	5.92	2,500		429		1,410		500		11,100
WWTP	**SW383**	**19 Apr 2018**	**0089_SW383_180419**	**Normal**	**209623**																	
WWTP	**SW383**	**30 Jan 2020**	**0089_SW383_200130**	**Normal**	**EP2001004**	<1	117	<1	117	620	653	19,800	2.60	2,820		455		1,460		544		11,400
WWTP	**SW383**	**02 Apr 2020**	**0089_SW383_200402**	**Normal**	**EP2003473**	<1	116	<1	116	640	707	20,500	4.99	2,840		493		1,620		716		12,200
WWTP	**SW383**	**21 Jul 2020**	**0089_SW383_200721**	**Normal**	**EP2007595**	<1	123	<1	123	576	694	18,300	9.26	2,770		485		1,540		654		12,100
WWTP	**SW383**	**23 Sep 2020**	**0089_SW383_200923**	**Normal**	**EP2010222**	<1	120	<1	120	632	681	20,200	3.70	2,880		482		1,540		655		11,800
WWTP	**SW383**	**16 Dec 2020**	**0089_SW383_201216**	**Normal**	**EP2014090**	<1	107	<1	107	626	655	20,000	2.22	2,890		484		1,500		621		11,300
WWTP	**SW383**	**17 Mar 2021**	**0089_SW383_210317**	**Normal**	**EP2102892**	<1	119	<1	119	624	568	19,900	4.76	2,920		406		1,250		532		9,910
WWTP	**SW383**	**08 Jun 2021**	**0089_SW383_210608**	**Normal**	**EP2106450**	<1	114	<1	114	568	672	18,000	8.31	2,810		468		1,500		623		11,700
WWTP	**SW383**	**30 Aug 2021**	**0089_SW383_210830**	**Normal**	**EP2110017**	<1	113	<1	113	539	583	17,200	3.90	2,490		420		1,310		583		10,100
WWTP	**SW383**	**11 Jan 2022**	**0089_SW383_220111**	**Normal**	**EP2200240**	<1	120	<1	120	615	653	19,800	3.02	2,590		438		1,430		522		11,500
WWTP	**SW383**	**07 Jun 2022**	**0089_SW383_220607**	**Normal**	**EP2206884**	<1	124	<1	124	548	641	17,400	7.79	2,650		485		1,490		620		11,000
WWTP	**SW383**	**07 Sep 2022**	**0089_SW383_220907**	**Normal**	**EP2211496**	<1	118	<1	118	520	630	16,500	9.58	2,500		437		1,420		501		11,000
WWTP	**SW383**	**12 Dec 2022**	**0089_SW383_221212**	**Normal**	**EP2216873**	<1	125	<1	125	685	672	22,100	0.94	2,830		458		1,470		586		11,800
WWTP	**SW383**	**15 Mar 2023**	**0089_SW383_230315**	**Normal**	**EP2303229**	<1	121	<1	121	630	669	20,300	2.96	2,660		451		1,450		542		11,800
WWTP	**SW383**	**05 Sep 2023**	**0089_SW383_230905**	**Normal**	**EP2312188**	<1	127	<1	127	564	633	18,100	5.80	2,420		427		1,410		500		11,100
WWTP	**SW384**	**19 Apr 2018**	**0089_SW384_180419**	**Normal**	**209623**																	
WWTP	**SW384**	**30 Jan 2020**	**0089_SW384_200130**	**Normal**	**EP2001004**	<1	118	<1	118	628	672	20,100	3.41	2,820		464		1,480		555		11,800
WWTP	**SW384**	**02 Apr 2020**	**0089_SW384_200402**	**Normal**	**EP2003473**	<1	116	<1	116	587	710	18,600	9.51	2,870		517		1,630		762		12,200
WWTP	**SW384**	**21 Jul 2020**	**0089_SW384_200721**	**Normal**	**EP2007595**	<1	124	<1	124	572	655	18,200	6.69	2,720		459		1,460		613		11,400
WWTP	**SW384**	**23 Sep 2020**	**0089_SW384_200923**	**Normal**	**EP2010222**	<1	123	<1	123	626	687	20,000	4.68	2,850		489		1,560		663		11,900
WWTP	**SW384**	**16 Dec 2020**	**0089_SW384_201216**	**Normal**	**EP2014090**	<1	117	<1	117	626	690	20,000	4.91	2,850		511		1,590		647		11,900
WWTP	**SW384**	**17 Mar 2021**	**0089_SW384_210317**	**Normal**	**EP2102901**	<1	113	<1	113	649	724	20,800	5.50	2,880		512		1,610		716		12,600
WWTP	**SW384**	**08 Jun 2021**	**0089_SW384_210608**	**Normal**	**EP2106450**	<1	113	<1	113	562	654	17,800	7.58	2,770		454		1,460		608		11,400
WWTP	**SW384**	**30 Aug 2021**	**0089_SW384_210830**	**Normal**	**EP2110017**	<1	118	<1	118	556	584	17,800	2.44	2,480		421		1,320		586		10,100
WWTP	**SW384**	**11 Jan 2022**	**0089_SW384_220111**	**Normal**	**EP2200240**	<1	119	<1	119	608	626	19,500	1.46	2,660		421		1,380		498		11,000
WWTP	**SW384**	**14 Mar 2022**	**0089_SW384_220314**	**Normal**	**EP2202980**	<1	121	<1	121	583	691	18,600	8.46	2,680		482		1,560		634		12,000
WWTP	**SW384**	**07 Jun 2022**	**0089_SW384_220607**	**Normal**	**EP2206884**	<1	123	<1	123	605	605	19,200	0.03	2,910		452		1,400		581		10,400
WWTP	**SW384**	**07 Sep 2022**	**0089_SW384_220907**	**Normal**	**EP2211496**	<1	122	<1	122	527	629	16,800	8.83	2,420		433		1,410		493		11,000
WWTP	**SW384**	**12 Dec 2022**	**0089_SW384_221212**	**Normal**	**EP2216873**	<1	125	<1	125	668	638	21,500	2.28	2,820		443		1,390		557		11,200
WWTP	**SW384**	**15 Mar 2023**	**0089_SW384_230315**	**Normal**	**EP2303229**	<1	121	<1	121	601	662	19,300	4.86	2,600		444		1,430		531		11,700
WWTP	**SW384**	**07 Jun 2023**	**0089_SW384_230607**	**Normal**	**EP2307493**	<1	118	<1	118	624	672	20,000	3.70	2,770		418		1,220		450		12,400
WWTP	**SW384**	**05 Sep 2023**	**0089_SW384_230905**	**Normal**	**EP2312184**	<1	125	<1	125	626	648	20,300	1.75	2,440		434		1,430		508		11,400
HSF	**SW406**	**14 Jan 2020**	**0089_SW406_200114**	**Normal**	**EP2000422**	<1	126	<1	126	601	689	17,800	6.80	4,650		546		1,610		633		11,800
HSF	**SW406**	**01 Apr 2020**	**0089_SW406_200401**	**Normal**	**EP2003420**	<1	117	<1	117	598	686	19,000	6.90	2,850		486		1,580		731		11,800
HSF	**SW406**	**22 Jul 2020**	**0089_QC113_200722**	**Field Duplicate**	**EP2007649**	<1	148	<1	148	575	649	18,300	6.04	2,690		435		1,390		502		11,500
HSF	**SW406**	**22 Jul 2020**	**0089_QC213_200722**	**Interlab Duplicate**	**734409**	<10	120	<20	120			20,000			690		2,100		630		8,600	
HSF	**SW406**	**22 Jul 2020**	**0089_SW406_200722**	**Normal**	**EP2007649**	<1	122	<1	122	590	650	18,800	4.86	2,740		435		1,400		504		11,500
HSF	**SW406**	**21 Sep 2020**	**0089_QC111_200921**	**Field Duplicate**	**EP2010083**	<1	138	<1	138	551	673	17,300	9.97	2,910		475		1,510		648		11,700
HSF	**SW406**	**21 Sep 2020**	**0089_QC211_200921**	**Interlab Duplicate**	**746269**	<10	110	<20	110			18,000			450		1,400		410		11,000	
HSF	**SW406**	**21 Sep 2020**	**0089_SW406_200921**	**Normal**	**EP2010083**	<1	131	<1	131	560	697	17,600	10.9	2,910		500		1,560		671		12,100
HSF	**SW406**	**15 Dec 2020**	**0089_SW406_201215**	**Normal**	**EP2014048**	<1	137	<1	137	620	676	19,800	4.30	2,820		495		1,520		667		11,700
HSF	**SW406**	**15 Mar 2021**	**0089_SW406_210315**	**Normal**	**EP2102756**	<1	116	<1	116	592	686	18,800	7.40	2,840		475		1,510		640		12,000
HSF	**SW406**	**10 Jun 2021**	**0089_SW406_210610**	**Normal**	**EP2106590**	<1	112	<1	112	584	692	18,600	8.50	2,740		494		1,560		680		12,000
HSF	**SW406**	**31 Aug 2021**	**0089_SW406_210831**	**Normal**	**EP2110065**	<1	123	<1	123	545	576	17,500	2.77	2,360		406		1,310		518		10,000
HSF	**SW406**	**14 Jan 2022**	**0089_SW406_220114**	**Normal**	**EP2200400**	<1	126	<1	126	621	658	20,000	2.87	2,630		459		1,460		582		11,500
HSF	**SW406**	**16 Mar 2022**	**0089_SW406_220316**	**Normal**	**EP2203058**	<1	123	<1	123	613	636	19,500	1.85	2,910		442		1,460		608		11,000
HSF	**SW406**	**07 Jun 2022**	**0089_SW406_220607**	**Normal**	**EP2206887**	<1	122	<1	122	604	594	19,200	0.86	2,900		445		1,380		575		10,200
HSF	**SW406**	**07 Sep 2022**	**0089_SW406_220907**	**Normal**	**EP2211496**	<1	120	<1	120	525	612	16,700	7.62	2,480		423		1,370		485		10,700
HSF	**SW406**	**13 Dec 2022**	**0089_SW406_221213**	**Normal**	**EP2216969**	<1	125	<1	125	700	665	22,500	2.51	3,000		462		1,440		583		11,700
HSF	**SW406**	**14 Mar 2023**	**0089_SW406_230314**	**Normal**	**EP2303179**	<1	127	<1	127	634	648	20,300	1.12	2,820		435		1,420		542		11,400
HSF	**SW406**	**08 Jun 2023**	**0089_SW406_230608**	**Normal**	**EP2307592**	<1	130	<1	130	545	597	17,400	4.50	2,490		446		1,210		367		10,700
HSF	**SW406**	**05 Sep 2023**	**0089_SW406_230905**	**Normal**	**EP2312184**	<1	133	<1	133	574	647	18,400	5.94	2,540		447		1,450		548		11,300
HSF	**SW408**	**14 Jan 2020**	**0089_SW408_200114**	**Normal**	**EP2000422**	<1	134	<1	134	598	694	19,100	7.42	2,730		498		1,570		708		12,000
HSF	**SW408**	**01 Apr 2020**	**0089_SW408_200401**	**Normal**	**EP2003420**	<1	119	<1	119	601	691	19,200	7.03	2,720		482		1,560		666		12,000
HSF	**SW408**	**22 Jul 2020**	**0089_SW408_200722**	**Normal**	**EP2007649**	<1	122	<1	122	585	650	18,600	5.28	2,780		437		1,400		506		11,500
HSF	**SW408**	**21 Sep 2020**	**0089_SW408_200921**	**Normal**	**EP2010083**	<1	134	<1	134	554	703	17,400	11.9	2,900		500		1,580		682		12,200
HSF	**SW408**	**15 Dec 2020**	**0089_SW408_201215**	**Normal**	**EP2014053**	<1	142	<1	142	610	660	19,300	4.01	2,990		488		1,500		657		11,400
HSF	**SW408**	**15 Mar 2021**	**0089_SW408_210315**	**Normal**	**EP2102756**	<1	118	<1	118	597	709	19,000	8.60	2,810		489		1,560		664		12,400
HSF	**SW408**	**10 Jun 2021**	**0089_SW408_210610**	**Normal**	**EP2106590**	<1	135	<1	135	578	652	18,500	6.04	2,560		468		1,470		638		11,300
HSF	**SW408**	**31 Aug 2021**	**0089_SW408_210831**	**Normal**	**EP2110072**	<1	126	<1	126	554	662	17,700	8.88	2,510		478		1,490		600		11,500
HSF	**SW408**	**14 Jan 2022**	**0089_SW408_220114**	**Normal**	**EP2200400**	<1	124	<1	124	621	648	20,000	2.17	2,600		455		1,450		578		11,300
HSF	**SW408**	**16 Mar 2022**	**0089_SW408_220316**	**Normal**	**EP2203058**	<1	122	<1	122	622	675	19,800	4.09	2,950		466		1,540		648		11,700
HSF	**SW408**	**07 Jun 2022**	**0089_SW408_220607**	**Normal**	**EP2206887**	<1	124	<1	124	548	627	17,300	6.73	2,780		458		1,460		575		10,800
HSF	**SW408**	**07 Sep 2022**	**0089_SW408_220907**	**Normal**	**EP2211498**	<1	122	<1	122	563	601	18,000	3.25	2,530		416		1,350		473		10,500
HSF	**SW408**	**13 Dec 2022**	**0089_SW408_221213**	**Normal**	**EP2216969**	<1	129	<1	129	690	631	22,200	4.49	2,940		437		1,360		554		11,100
HSF	**SW408**	**14 Mar 2023**	**0089_SW408_230314**	**Normal**	**EP2303179**	<1	133	<1	133	609	670	19,500	4.77	2,720		456		1,460		555		11,800
HSF	**SW408**	**08 Jun 2023**	**0089_SW408_230608**	**Normal**	**EP2307592**	<1	130	<1	130	543	606	17,300	5.42	2,540		455		1,210		365		10,900
HSF	**SW408**	**05 Sep 2023**	**0089_SW408_230905**	**Normal**	**EP2312184**	<1	132	<1	132	576	641	18,500	5.36	2,460		444		1,430		543		11,200
HSF	**SW410**	**14 Jan 2020**	**0089_SW410_200114**	**Normal**	**EP2000422**	<1	179	<1	179	608	723	19,400	8.63	2,740		519		1,630		741		12,500
HSF	**SW410**	**02 Apr 2020**	**0089_SW410_200402**	**Normal**	**EP2003471**	<1	116	<1	116	608	714	19,400	7.98	2,820		510		1,590		706		12,400
HSF	**SW410**	**21 Jul 2020**	**0089_SW410_200721**	**Normal**	**EP2007604**	<1	127	<1	127	569	658	18,200	7.22	2,560		520		1,440		686		11,400
HSF	**SW410**	**22 Sep 2020**	**0089_SW410_200922**	**Normal**	**EP2010145**	<1	130	<1	130	612	647	19,600	2.73	2,740		474		1,460		624		11,200
HSF	**SW410**	**15 Dec 2020**	**0089_SW410_201215**	**Normal**	**EP2014044**	<1	141	<1	141	614	689	19,600	5.71	2,820		484		1,540		627		12,000

Table 3 - Surface water Analytical Results

						Inorganics									Metals								
						Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																						
PFAS NEMP 2020 Freshwater 99%																						
PFAS NEMP 2020 Recreational Water																						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
HSF	**SW410**	**17 Mar 2021**	**0089_SW410_210317**	**Normal**	**EP2102901**	<1	112	<1	112	656	755	21,000	7.01	2,960		540		1,690		758		13,100
HSF	**SW410**	**10 Jun 2021**	**0089_QC114_210610**	**Field Duplicate**	**EP2106590**	<1	114	<1	114	575	647	18,400	5.87	2,590		469		1,460		635		11,200
HSF	**SW410**	**10 Jun 2021**	**0089_QC214_210610**	**Interlab Duplicate**	**802734**	<10	120	<20	120			20,000			670		1,700		600		14,000	
HSF	**SW410**	**10 Jun 2021**	**0089_SW410_210610**	**Normal**	**EP2106590**	<1	110	<1	110	579	675	18,500	7.71	2,620		488		1,520		660		11,700
HSF	**SW410**	**31 Aug 2021**	**0089_SW410_210831**	**Normal**	**EP2110065**	<1	124	<1	124	547	585	17,500	3.38	2,450		412		1,310		522		10,200
HSF	**SW410**	**14 Jan 2022**	**0089_SW410_220114**	**Normal**	**EP2200400**	<1	126	<1	126	636	647	20,500	0.92	2,630		452		1,440		576		11,300
HSF	**SW410**	**16 Mar 2022**	**0089_SW410_220316**	**Normal**	**EP2203058**	<1	125	<1	125	600	640	19,000	3.28	2,950		443		1,460		606		11,100
HSF	**SW410**	**07 Jun 2022**	**0089_SW410_220607**	**Normal**	**EP2206887**	<1	120	<1	120	561	640	17,900	6.56	2,580		460		1,500		585		11,000
HSF	**SW410**	**06 Sep 2022**	**0089_SW410_220906**	**Normal**	**EP2211391**	<1	120	<1	120	536	608	17,100	6.26	2,470		427		1,370		494		10,600
HSF	**SW410**	**13 Dec 2022**	**0089_SW410_221213**	**Normal**	**EP2216934**	<1	147	<1	147	646	660	20,900	1.07	2,570		451		1,430		594		11,600
HSF	**SW410**	**14 Mar 2023**	**0089_SW410_230314**	**Normal**	**EP2303179**	<1	122	<1	122	616	653	19,700	2.88	2,800		440		1,420		544		11,500
HSF	**SW410**	**08 Jun 2023**	**0089_SW410_230608**	**Normal**	**EP2307592**	<1	124	<1	124	551	596	17,600	3.95	2,510		461		1,200		366		10,700
HSF	**SW410**	**04 Sep 2023**	**0089_QC107_230904**	**Field Duplicate**	**EP2312228**																	
HSF	**SW410**	**04 Sep 2023**	**0089_QC207_230904**	**Interlab Duplicate**	**1023399**																	
HSF	**SW410**	**04 Sep 2023**	**0089_SW410_230904**	**Normal**	**EP2312228**	<1	132	<1	132	553	652	17,700	8.24	2,450		464		1,490		582		11,300
HSF	**SW412**	**14 Jan 2020**	**0089_SW412_200114**	**Normal**	**EP2000422**	<1	115	<1	115	603	720	19,200	8.82	2,860		504		1,610		735		12,500
HSF	**SW412**	**01 Apr 2020**	**0089_SW412_200401**	**Normal**	**EP2003418**	<1	117	<1	117	594	681	18,900	6.84	2,800		488		1,570		726		11,700
HSF	**SW412**	**21 Jul 2020**	**0089_SW412_200721**	**Normal**	**EP2007604**	<1	122	<1	122	573	656	18,200	6.81	2,740		514		1,430		679		11,400
HSF	**SW412**	**22 Sep 2020**	**0089_SW412_200922**	**Normal**	**EP2010145**	<1	140	<1	140	608	625	19,400	1.42	2,770		462		1,420		607		10,800
HSF	**SW412**	**15 Dec 2020**	**0089_SW412_201215**	**Normal**	**EP2014044**	<1	119	<1	119	600	712	19,100	8.52	2,820		494		1,590		652		12,400
HSF	**SW412**	**18 Mar 2021**	**0089_SW412_210318**	**Normal**	**EP2102956**	<1	111	<1	111	625	638	20,100	0.97	2,700		443		1,430		589		11,100
HSF	**SW412**	**09 Jun 2021**	**0089_SW412_210609**	**Normal**	**EP2106517**	<1	116	<1	116	584	714	18,600	9.97	2,760		482		1,590		600		12,500
HSF	**SW412**	**01 Sep 2021**	**0089_SW412_210901**	**Normal**	**EP2110155**	<1	118	<1	118	549	631	17,700	6.98	2,260		437		1,410		578		11,000
HSF	**SW412**	**14 Jan 2022**	**0089_SW412_220114**	**Normal**	**EP2200400**	<1	119	<1	119	645	658	20,800	1.04	2,670		456		1,460		589		11,500
HSF	**SW412**	**16 Mar 2022**	**0089_SW412_220316**	**Normal**	**EP2203058**	<1	123	<1	123	599	670	19,100	5.62	2,770		464		1,530		648		11,600
HSF	**SW412**	**07 Jun 2022**	**0089_SW412_220607**	**Normal**	**EP2206887**	<1	122	<1	122	540	616	17,200	6.55	2,530		443		1,440		560		10,600
HSF	**SW412**	**06 Sep 2022**	**0089_SW412_220906**	**Normal**	**EP2211401**	<1	119	<1	119	588	624	18,900	2.93	2,540		438		1,400		496		10,900
HSF	**SW412**	**14 Dec 2022**	**0089_SW412_221214**	**Normal**	**EP2216973**	<1	119	<1	119	637	690	20,600	4.01	2,560		478		1,510		609		12,100
HSF	**SW412**	**15 Mar 2023**	**0089_SW412_230315**	**Normal**	**EP2303229**	<1	121	<1	121	626	663	20,100	2.82	2,740		450		1,430		537		11,700
HSF	**SW412**	**08 Jun 2023**	**0089_SW412_230608**	**Normal**	**EP2307592**	<1	119	<1	119	601	608	19,200	0.55	2,740		472		1,220		374		10,900
HSF	**SW412**	**04 Sep 2023**	**0089_QC109_230904**	**Field Duplicate**	**EP2312228**																	
HSF	**SW412**	**04 Sep 2023**	**0089_QC209_230904**	**Interlab Duplicate**	**1023399**																	
HSF	**SW412**	**04 Sep 2023**	**0089_SW412_230904**	**Normal**	**EP2312228**	<1	128	<1	128	568	623	18,200	4.64	2,480		440		1,420		554		10,800
HSF	**SW414**	**14 Jan 2020**	**0089_SW414_200114**	**Normal**	**EP2000422**	<1	119	<1	119	618	728	19,300	8.14	3,430		515		1,640		747		12,600
HSF	**SW414**	**02 Apr 2020**	**0089_SW414_200402**	**Normal**	**EP2003473**	<1	114	<1	114	592	687	18,800	7.44	2,850		497		1,580		744		11,800
HSF	**SW414**	**21 Jul 2020**	**0089_SW414_200721**	**Normal**	**EP2007604**	<1	124	<1	124	573	672	18,200	7.96	2,740		471		1,500		634		11,700
HSF	**SW414**	**22 Sep 2020**	**0089_SW414_200922**	**Normal**	**EP2010145**	<1	119	<1	119	608	584	19,400	1.99	2,780		426		1,320		569		10,100
HSF	**SW414**	**15 Dec 2020**	**0089_SW414_201215**	**Normal**	**EP2014044**	<1	124	<1	124	605	654	19,200	3.90	2,930		457		1,460		602		11,400
HSF	**SW414**	**18 Mar 2021**	**0089_SW414_210318**	**Normal**	**EP2102941**	<1	107	<1	107	601	642	19,200	3.32	2,760		448		1,430		598		11,200
HSF	**SW414**	**09 Jun 2021**	**0089_SW414_210609**	**Normal**	**EP2106517**	<1	114	<1	114	583	710	18,700	9.81	2,580		503		1,620		665		12,300
HSF	**SW414**	**01 Sep 2021**	**0089_SW414_210901**	**Normal**	**EP2110155**	<1	116	<1	116	547	621	17,600	6.36	2,310		433		1,400		572		10,800
HSF	**SW414**	**14 Jan 2022**	**0089_SW414_220114**	**Normal**	**EP2200400**	<1	121	<1	121	630	642	20,300	0.88	2,660		446		1,430		569		11,200
HSF	**SW414**	**16 Mar 2022**	**0089_SW414_220316**	**Normal**	**EP2203058**	<1	126	<1	126	610	623	19,400	1.08	2,890		431		1,420		592		10,800
HSF	**SW414**	**07 Jun 2022**	**0089_QC116_220607**	**Field Duplicate**	**EP2206887**																	
HSF	**SW414**	**07 Jun 2022**	**0089_QC216_220607**	**Interlab Duplicate**	**896805**																	
HSF	**SW414**	**07 Jun 2022**	**0089_SW414_220607**	**Normal**	**EP2206887**	<1	120	<1	120	547	600	17,300	4.63	2,700		434		1,410		546		10,300
HSF	**SW414**	**06 Sep 2022**	**0089_SW414_220906**	**Normal**	**EP2211401**	<1	119	<1	119	575	602	18,400	2.28	2,580		420		1,360		481		10,500
HSF	**SW414**	**14 Dec 2022**	**0089_SW414_221214**	**Normal**	**EP2216973**	<1	123	<1	123	634	706	20,500	5.36	2,570		487		1,540		616		12,400
HSF	**SW414**	**15 Mar 2023**	**0089_SW414_230315**	**Normal**	**EP2303229**	<1	121	<1	121	643	658	20,700	1.18	2,730		452		1,430		538		11,600
HSF	**SW414**	**08 Jun 2023**	**0089_SW414_230608**	**Normal**	**EP2307592**	<1	122	<1	122	603	592	19,300	0.88	2,690		462		1,200		369		10,600
HSF	**SW414**	**04 Sep 2023**	**0089_SW414_230904**	**Normal**	**EP2312228**	<1	126	<1	126	573	623	18,400	4.15	2,480		442		1,420		551		10,800
HSF	**SW416**	**14 Jan 2020**	**0089_SW416_200114**	**Normal**	**EP2000422**	<1	118	<1	118	615	689	19,400	5.69	3,140		486		1,570		710		11,900
HSF	**SW416**	**02 Apr 2020**	**0089_SW416_200402**	**Normal**	**EP2003473**	<1	118	<1	118	648	730	20,800	5.97	2,830		511		1,670		753		12,600
HSF	**SW416**	**21 Jul 2020**	**0089_SW416_200721**	**Normal**	**EP2007604**	<1	122	<1	122	577	662	18,400	6.86	2,680		470		1,490		628		11,500
HSF	**SW416**	**22 Sep 2020**	**0089_SW416_200922**	**Normal**	**EP2010145**	<1	126	<1	126	613	619	19,600	0.43	2,780		454		1,400		600		10,700
HSF	**SW416**	**15 Dec 2020**	**0089_SW416_201215**	**Normal**	**EP2014044**	<1	126	<1	126	621	712	19,800	6.77	2,900		495		1,590		654		12,400
HSF	**SW416**	**18 Mar 2021**	**0089_SW416_210318**	**Normal**	**EP2102941**	<1	114	<1	114	631	655	20,200	1.88	2,840		461		1,470		608		11,400
HSF	**SW416**	**09 Jun 2021**	**0089_SW416_210609**	**Normal**	**EP2106517**	<1	118	<1	118	568	692	18,200	9.87	2,500		492		1,570		645		12,000
HSF	**SW416**	**01 Sep 2021**	**0089_SW416_210901**	**Normal**	**EP2110155**	<1	118	<1	118	558	604	18,000	3.94	2,300		424		1,360		548		10,500
HSF	**SW416**	**14 Jan 2022**	**0089_SW416_220114**	**Normal**	**EP2200400**	<1	120	<1	120	627	647	20,200	1.59	2,640		454		1,440		578		11,300
HSF	**SW416**	**16 Mar 2022**	**0089_SW416_220316**	**Normal**	**EP2203058**	<1	116	<1	116	603	682	19,200	6.14	2,840		473		1,560		653		11,800
HSF	**SW416**	**07 Jun 2022**	**0089_SW416_220607**	**Normal**	**EP2206887**	<1	123	<1	123	559	624	17,800	5.56	2,600		453		1,480		573		10,700
HSF	**SW416**	**06 Sep 2022**	**0089_SW416_220906**	**Normal**	**EP2211401**	<1	118	<1	118	575	619	18,400	3.71	2,580		434		1,400		502		10,800
HSF	**SW416**	**14 Dec 2022**	**0089_SW416_221214**	**Normal**	**EP2216973**	<1	124	<1	124	646	690	20,900	3.35	2,570		480		1,510		614		12,100
HSF	**SW416**	**15 Mar 2023**	**0089_SW416_230315**	**Normal**	**EP2303229**	<1	121	<1	121	621	668	19,900	3.63	2,750		448		1,440		537		11,800
HSF	**SW416**	**08 Jun 2023**	**0089_SW416_230608**	**Normal**	**EP2307592**	<1	120	<1	120	548	601	17,500	4.56	2,510		455		1,200		371		10,800
HSF	**SW416**	**04 Sep 2023**	**0089_SW416_230904**	**Normal**	**EP2312228**	<1	128	<1	128	558	617	17,900	5.00	2,450		438		1,410		544		10,700

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Freshwater 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
WWTP	SD304	17 Apr 2018	0089_SD304_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
WWTP	SD304	08 Jan 2020	0089_SD304_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	01 Apr 2020	0089_SD304_0.40-0.50_200401	Normal	EP2003415	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	20 Jul 2020	0089_SD304_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	22 Sep 2020	0089_SD304_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	15 Dec 2020	0089_SD304_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	15 Mar 2021	0089_SD304_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	10 Jun 2021	0089_SD304_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	01 Sep 2021	0089_SD304_210901	Normal	EP2110157	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	11 Jan 2022	0089_SD304_220111	Normal	EP2200242	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	18 Mar 2022	0089_SD304_220318	Normal	EP2203196	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	08 Jun 2022	0089_SD304_220608	Normal	EP2206972	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	05 Sep 2022	0089_SD304_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	12 Dec 2022	0089_SD304_221212	Normal	EP2216880	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	13 Mar 2023	0089_SD304_230313	Normal	EP2303087	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	07 Jun 2023	0089_SD304_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	05 Sep 2023	0089_SD304_230905	Normal	EP2312180	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	18 Apr 2018	0089_SD306_180418	Normal	209573	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
HSF	SD306	10 Jan 2020	0089_SD306_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	31 Mar 2020	0089_SD306_200331_1.00-1.20_20033	Normal	EP2003368	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	22 Jul 2020	0089_SD306_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	23 Sep 2020	0089_SD306_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	15 Dec 2020	0089_SD306_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	17 Mar 2021	0089_SD306_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	09 Jun 2021	0089_SD306_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	31 Aug 2021	0089_QC115_210831	Field Duplicate	EP2110074	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	31 Aug 2021	0089_QC215_210831	Interlab Duplicate	821197	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
HSF	SD306	31 Aug 2021	0089_SD306_210831	Normal	EP2110074	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	13 Jan 2022	0089_SD306_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	16 Mar 2022	0089_SD306_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	07 Jun 2022	0089_SD306_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	06 Sep 2022	0089_SD306_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	13 Dec 2022	0089_SD306_221212	Normal	EP2216931	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	14 Mar 2023	0089_SD306_230314	Normal	EP2303176	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	08 Jun 2023	0089_SD306_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	04 Sep 2023	0089_SD306_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	30 Apr 2018	0089_SD307_180430	Normal	209959	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
HSF	SD307	10 Jan 2020	0089_SD307_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	31 Mar 2020	0089_SD307_200331_1.00-1.20_20033	Normal	EP2003368	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	22 Jul 2020	0089_SD307_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	23 Sep 2020	0089_SD307_200923	Normal	EP2010221	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	15 Dec 2020	0089_SD307_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	17 Mar 2021	0089_SD307_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	09 Jun 2021	0089_SD307_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	31 Aug 2021	0089_SD307_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	13 Jan 2022	0089_SD307_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	16 Mar 2022	0089_SD307_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	07 Jun 2022	0089_SD307_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	06 Sep 2022	0089_SD307_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	13 Dec 2022	0089_SD307_221212	Normal	EP2216931	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	14 Mar 2023	0089_SD307_230314	Normal	EP2303176	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	08 Jun 2023	0089_SD307_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	04 Sep 2023	0089_SD307_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	30 Apr 2018	0089_SD308_180430	Normal	209959	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
HSF	SD308	10 Jan 2020	0089_SD308_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	01 Apr 2020	0089_SD308_1.00-1.20_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	22 Jul 2020	0089_SD308_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	23 Sep 2020	0089_SD308_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	15 Dec 2020	0089_SD308_0.50_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	17 Mar 2021	0089_QC117_210317	Field Duplicate	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	17 Mar 2021	0089_QC217_210317	Interlab Duplicate	782088	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
HSF	SD308	17 Mar 2021	0089_SD308_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	09 Jun 2021	0089_SD308_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	31 Aug 2021	0089_SD308_210831	Normal	EP2110074	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	13 Jan 2022	0089_SD308_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	16 Mar 2022	0089_SD308_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	07 Jun 2022	0089_SD308_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	06 Sep 2022	0089_SD308_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	13 Dec 2022	0089_SD308_221212	Normal	EP2216931	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	14 Mar 2023	0089_SD308_230314	Normal	EP2303176	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	08 Jun 2023	0089_SD308_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	04 Sep 2023	0089_SD308_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	18 Apr 2018	0089_SD314_180418	Normal	209573	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
HSF	SD314	10 Jan 2020	0089_SD314_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	31 Mar 2020	0089_SD314_200331_0.60-0.80_20033	Normal	EP2003368	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	22 Jul 2020	0089_SD314_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	23 Sep 2020	0089_SD314_200923	Normal	EP2010221	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	15 Dec 2020	0089_SD314_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	17 Mar 2021	0089_SD314_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	09 Jun 2021	0089_SD314_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	31 Aug 2021	0089_SD314_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	13 Jan 2022	0089_SD314_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	16 Mar 2022	0089_SD314_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	07 Jun 2022	0089_QC102_220607	Field Duplicate	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	07 Jun 2022	0089_QC202_220607	Interlab Duplicate	896805	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD314	07 Jun 2022	0089_SD314_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	06 Sep 2022	0089_SD314_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	13 Dec 2022	0089_SD314_221212	Normal	EP2216931	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005

Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
HSF	SD314	14 Mar 2023	0089_SD314_230314	Normal	EP2303176	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	08 Jun 2023	0089_SD314_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	04 Sep 2023	0089_SD314_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	30 Apr 2018	0089_SD315_180430	Normal	209959	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
HSF	SD315	10 Jan 2020	0089_SD315_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	01 Apr 2020	0089_SD315_1.00-1.20_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	22 Jul 2020	0089_SD315_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	23 Sep 2020	0089_SD315_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	15 Dec 2020	0089_SD315_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	17 Mar 2021	0089_SD315_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	09 Jun 2021	0089_SD315_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	31 Aug 2021	0089_SD315_210831	Normal	EP2110074	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	13 Jan 2022	0089_SD315_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	16 Mar 2022	0089_SD315_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	07 Jun 2022	0089_SD315_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	06 Sep 2022	0089_SD315_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	13 Dec 2022	0089_SD315_221212	Normal	EP2216931	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	14 Mar 2023	0089_SD315_230314	Normal	EP2303176	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	08 Jun 2023	0089_SD315_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	04 Sep 2023	0089_SD315_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	30 Apr 2018	0089_SD316_180430	Normal	209959	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
HSF	SD316	10 Jan 2020	0089_SD316_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	01 Apr 2020	0089_SD316_1.20-1.40_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	22 Jul 2020	0089_SD316_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	23 Sep 2020	0089_SD316_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	15 Dec 2020	0089_SD316_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	17 Mar 2021	0089_SD316_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	09 Jun 2021	0089_SD316_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	31 Aug 2021	0089_SD316_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	13 Jan 2022	0089_SD316_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	16 Mar 2022	0089_SD316_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	07 Jun 2022	0089_SD316_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	06 Sep 2022	0089_SD316_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	13 Dec 2022	0089_SD316_221212	Normal	EP2216931	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	14 Mar 2023	0089_SD316_230314	Normal	EP2303176	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	08 Jun 2023	0089_SD316_230608	Normal	EP2307589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	04 Sep 2023	0089_SD316_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	12 Apr 2018	0089_SD329_180412	Normal	209345	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
Demolition Grounds	SD329	10 Jan 2020	0089_SD329_200110	Normal	EP2000253	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	30 Mar 2020	0089_SD329_200330_0.50-0.60_20033	Normal	EP2003310	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	20 Jul 2020	0089_SD329_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	23 Sep 2020	0089_SD329_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	14 Dec 2020	0089_QC101_201214	Field Duplicate	EP2013974	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	14 Dec 2020	0089_QC201_201114	Interlab Duplicate	765054	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Demolition Grounds	SD329	14 Dec 2020	0089_SD329_201214	Normal	EP2013974	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	16 Mar 2021	0089_SD329_210316	Normal	EP2102838	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	08 Jun 2021	0089_QC104_210608	Field Duplicate	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	08 Jun 2021	0089_QC204_210608	Interlab Duplicate	802464	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Demolition Grounds	SD329	08 Jun 2021	0089_SD329_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	30 Aug 2021	0089_SD329_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	10 Jan 2022	0089_QC109_220110	Field Duplicate	EP2200219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	10 Jan 2022	0089_QC209_220110	Interlab Duplicate	854607	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Demolition Grounds	SD329	10 Jan 2022	0089_SD329_220110	Normal	EP2200219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	15 Mar 2022	0089_QC115_220315	Field Duplicate	EP2203020	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	15 Mar 2022	0089_QC215_220315	Interlab Duplicate	872903	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Demolition Grounds	SD329	15 Mar 2022	0089_SD329_220315	Normal	EP2203020	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	08 Jun 2022	0089_SD329_220608	Normal	EP2206968	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	05 Sep 2022	0089_SD329_220905	Normal	EP2211348	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	12 Dec 2022	0089_SD329_221212	Normal	EP2216874	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	15 Mar 2023	0089_SD329_230315	Normal	EP2303228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	07 Jun 2023	0089_SD329_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD329	11 Sep 2023	0089_SD329_230911	Normal	EP2312526	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	12 Apr 2018	0089_SD330_180412	Normal	209345	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
Demolition Grounds	SD330	10 Jan 2020	0089_SD330_200110	Normal	EP2000253	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	30 Mar 2020	0089_SD330_200330_0.50-0.60_20033	Normal	EP2003310	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	20 Jul 2020	0089_SD330_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	22 Sep 2020	0089_SD330_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	14 Dec 2020	0089_SD330_201214	Normal	EP2013990	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	16 Mar 2021	0089_SD330_210316	Normal	EP2102838	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	08 Jun 2021	0089_SD330_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	30 Aug 2021	0089_SD330_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	10 Jan 2022	0089_SD330_220110	Normal	EP2200219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	15 Mar 2022	0089_SD330_220315	Normal	EP2203020	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	08 Jun 2022	0089_SD330_220608	Normal	EP2206968	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	05 Sep 2022	0089_SD330_220905	Normal	EP2211348	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	12 Dec 2022	0089_QC106_221212	Field Duplicate	EP2216874	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	12 Dec 2022	0089_QC206_221212	Interlab Duplicate	950091	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Demolition Grounds	SD330	12 Dec 2022	0089_SD330_221212	Normal	EP2216874	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	15 Mar 2023	0089_SD330_230315	Normal	EP2303228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	07 Jun 2023	0089_SD330_230607	Normal	EP2307499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD330	11 Sep 2023	0089_SD330_230911	Normal	EP2312526	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD331	12 Apr 2018	0089_SD331_180412	Normal	209345	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
Demolition Grounds	SD331	10 Jan 2020	0089_SD331_200110	Normal	EP2000253	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD331	30 Mar 2020	0089_SD331_200330_0.30-0.50_20033	Normal	EP2003310	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD331	20 Jul 2020	0089_SD331_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD331	23 Sep 2020	0089_SD331_200923	Normal	EP2010221	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD331	14 Dec 2020	0089_QC103_201214	Field Duplicate	EP2013974	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD331	14 Dec 2020	0089_QC203_201114	Interlab Duplicate	765054	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Demolition Grounds	SD331	14 Dec 2020	0089_SD331_201214	Normal	EP2013974	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	SD331	16 Mar 2021	0089_SD331_210316	Normal	EP2102838	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005

Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PPeA)	Perfluorohexanoic acid (PHHxA)	Perfluoroheptanoic acid (PHHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
Demolition Grounds	**SD331**	**08 Jun 2021**	**0089_SD331_210608**	**Normal**	**EP2106466**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD331**	**30 Aug 2021**	**0089_SD331_210830**	**Normal**	**EP2110018**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD331**	**10 Jan 2022**	**0089_SD331_220110**	**Normal**	**EP2200219**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD331**	**15 Mar 2022**	**0089_SD331_220315**	**Normal**	**EP2203020**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD331**	**08 Jun 2022**	**0089_SD331_220608**	**Normal**	**EP2206968**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD331**	**05 Sep 2022**	**0089_SD331_220905**	**Normal**	**EP2211348**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD331**	**12 Dec 2022**	**0089_SD331_221212**	**Normal**	**EP2216874**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD331**	**15 Mar 2023**	**0089_SD331_230315**	**Normal**	**EP2303228**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD331**	**07 Jun 2023**	**0089_SD331_230607**	**Normal**	**EP2307499**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD331**	**11 Sep 2023**	**0089_SD331_230911**	**Normal**	**EP2312526**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**13 Apr 2018**	**0089_QC1SD_180413**	**Field Duplicate**	**209417**	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
FTA	**SD335**	**13 Apr 2018**	**0089_QC2SD_180413**	**Interlab Duplicate**	**594110**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
FTA	**SD335**	**13 Apr 2018**	**0089_SD335_180413**	**Normal**	**209417**	<0.0001	<0.0001	<0.0001	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
FTA	**SD335**	**09 Jan 2020**	**0089_SD335_0.40-0.50_200109**	**Normal**	**EP2000250**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**30 Mar 2020**	**0089_SD335_0.50_200330**	**Normal**	**EP2003315**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**15 Jul 2020**	**0089_QC101_200715**	**Field Duplicate**	**EP2007384**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**15 Jul 2020**	**0089_QC201_200215**	**Interlab Duplicate**	**732844**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	**SD335**	**15 Jul 2020**	**0089_SD335_200715**	**Normal**	**EP2007384**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**22 Sep 2020**	**0089_SD335_200922**	**Normal**	**EP2010152**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**14 Dec 2020**	**0089_SD335_201214**	**Normal**	**EP2013986**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**15 Mar 2021**	**0089_SD335_210315**	**Normal**	**EP2102754**	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**08 Jun 2021**	**0089_SD335_210608**	**Normal**	**EP2106466**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**30 Aug 2021**	**0089_SD335_210830**	**Normal**	**EP2110022**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**10 Jan 2022**	**0089_QC103_220110**	**Field Duplicate**	**EP2200217**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**10 Jan 2022**	**0089_QC203_220110**	**Interlab Duplicate**	**854607**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	**SD335**	**10 Jan 2022**	**0089_SD335_220110**	**Normal**	**EP2200217**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**14 Mar 2022**	**0089_SD335_220314**	**Normal**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**07 Jun 2022**	**0089_QC113_220607**	**Field Duplicate**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**07 Jun 2022**	**0089_QC213_220607**	**Interlab Duplicate**	**896805**	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	**SD335**	**07 Jun 2022**	**0089_SD335_220607**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**05 Sep 2022**	**0089_SD335_220905**	**Normal**	**EP2211346**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**12 Dec 2022**	**0089_SD335_221212**	**Normal**	**EP2216880**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**13 Mar 2023**	**0089_QC104_230313**	**Field Duplicate**	**EP2303087**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**13 Mar 2023**	**0089_QC204_230313**	**Interlab Duplicate**	**972487**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	**SD335**	**13 Mar 2023**	**0089_SD335_230313**	**Normal**	**EP2303087**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**07 Jun 2023**	**0089_SD335_230607**	**Normal**	**EP2307501**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD335**	**05 Sep 2023**	**0089_SD335_230905**	**Normal**	**EP2312190**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**13 Apr 2018**	**0089_SD340_180413**	**Normal**	**209417**	<0.0001	<0.0001	<0.0001	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
FTA	**SD340**	**09 Jan 2020**	**0089_SD340_0.40-0.50_200109**	**Normal**	**EP2000250**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**30 Mar 2020**	**0089_QC108_200330**	**Field Duplicate**	**EP2003315**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**30 Mar 2020**	**0089_QC208_200330**	**Interlab Duplicate**	**711144**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	**SD340**	**30 Mar 2020**	**0089_SD340_200330**	**Normal**	**EP2003315**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**15 Jul 2020**	**0089_SD340_200715**	**Normal**	**EP2007384**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**22 Sep 2020**	**0089_SD340_200922**	**Normal**	**EP2010152**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**14 Dec 2020**	**0089_SD340_201214**	**Normal**	**EP2013987**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**15 Mar 2021**	**0089_SD340_210315**	**Normal**	**EP2102757**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**08 Jun 2021**	**0089_SD340_210608**	**Normal**	**EP2106449**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**30 Aug 2021**	**0089_QC107_210830**	**Field Duplicate**	**EP2110023**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**30 Aug 2021**	**0089_QC207_210830**	**Interlab Duplicate**	**820919**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	**SD340**	**30 Aug 2021**	**0089_SD340_210830**	**Normal**	**EP2110023**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**10 Jan 2022**	**0089_SD340_220110**	**Normal**	**EP2200217**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**14 Mar 2022**	**0089_SD340_220314**	**Normal**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**07 Jun 2022**	**0089_SD340_220607**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**05 Sep 2022**	**0089_QC105_220905**	**Field Duplicate**	**EP2211346**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**05 Sep 2022**	**0089_QC205_220905**	**Interlab Duplicate**	**920981**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	**SD340**	**05 Sep 2022**	**0089_SD340_220905**	**Normal**	**EP2211346**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**12 Dec 2022**	**0089_SD340_221212**	**Normal**	**EP2216880**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**13 Mar 2023**	**0089_QC108_230313**	**Field Duplicate**	**EP2303087**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**13 Mar 2023**	**0089_QC208_230313**	**Interlab Duplicate**	**972487**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	**SD340**	**13 Mar 2023**	**0089_SD340_230313**	**Normal**	**EP2303087**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**07 Jun 2023**	**0089_SD340_230607**	**Normal**	**EP2307501**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD340**	**05 Sep 2023**	**0089_SD340_230905**	**Normal**	**EP2312190**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**13 Apr 2018**	**0089_SD341_180413**	**Normal**	**209417**	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
FTA	**SD341**	**08 Jan 2020**	**0089_QC105_200108**	**Field Duplicate**	**EP2000181**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**08 Jan 2020**	**0089_QC205_200108**	**Interlab Duplicate**	**696100**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	**SD341**	**08 Jan 2020**	**0089_SD341_200108**	**Normal**	**EP2000181**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**31 Mar 2020**	**0089_SD341_200331**	**Normal**	**EP2003365**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**15 Jul 2020**	**0089_SD341_200715**	**Normal**	**EP2007384**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**22 Sep 2020**	**0089_SD341_200922**	**Normal**	**EP2010152**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**14 Dec 2020**	**0089_SD341_201214**	**Normal**	**EP2013987**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**15 Mar 2021**	**0089_SD341_210315**	**Normal**	**EP2102754**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**08 Jun 2021**	**0089_SD341_210608**	**Normal**	**EP2106449**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**30 Aug 2021**	**0089_SD341_210830**	**Normal**	**EP2110022**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**10 Jan 2022**	**0089_SD341_220110**	**Normal**	**EP2200213**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**14 Mar 2022**	**0089_SD341_220314**	**Normal**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**07 Jun 2022**	**0089_SD341_220607**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**05 Sep 2022**	**0089_SD341_220905**	**Normal**	**EP2211346**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**12 Dec 2022**	**0089_QC110_221212**	**Field Duplicate**	**EP2216880**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**12 Dec 2022**	**0089_QC210_221212**	**Interlab Duplicate**	**950091**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	**SD341**	**12 Dec 2022**	**0089_SD341_221212**	**Normal**	**EP2216880**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**13 Mar 2023**	**0089_SD341_230313**	**Normal**	**EP2303087**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**07 Jun 2023**	**0089_SD341_230607**	**Normal**	**EP2307501**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD341**	**05 Sep 2023**	**0089_SD341_230905**	**Normal**	**EP2312190**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**13 Apr 2018**	**0089_SD345_180413**	**Normal**	**209417**	<0.0001	<0.0001	<0.0001	<0.0002	0.0005	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
WWTP	**SD345**	**09 Jan 2020**	**0089_SD345_0.30-0.40_200109**	**Normal**	**EP2000250**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**31 Mar 2020**	**0089_SD345_0.40-0.50_200331**	**Normal**	**EP2003371**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**24 Sep 2020**	**0089_SD345_200924**	**Normal**	**EP2010272**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**15 Dec 2020**	**0089_SD345_201215**	**Normal**	**EP2014052**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**16 Mar 2021**	**0089_SD345_210316**	**Normal**	**EP2102835**	<0.0002	<0.0002	<0.0002	<0.0002	0.0017	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**09 Jun 2021**	**0089_SD345_210609**	**Normal**	**EP2106518**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002

Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
WWTP	**SD345**	**01 Sep 2021**	**0089_SD345_210901**	**Normal**	**EP2110156**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**10 Jan 2022**	**0089_SD345_220110**	**Normal**	**EP2200217**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**14 Mar 2022**	**0089_SD345_220314**	**Normal**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**07 Jun 2022**	**0089_SD345_220607**	**Normal**	**EP2206885**	<0.0002	<0.0002	<0.0002	<0.0002	0.0007	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**05 Sep 2022**	**0089_SD345_220905**	**Normal**	**EP2211342**	<0.0002	<0.0002	<0.0002	<0.0002	0.0016	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**13 Dec 2022**	**0089_SD345_221212**	**Normal**	**EP2216931**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**14 Mar 2023**	**0089_SD345_230314**	**Normal**	**EP2303176**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**07 Jun 2023**	**0089_SD345_230607**	**Normal**	**EP2307495**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**05 Sep 2023**	**0089_SD345_230905**	**Normal**	**EP2312171**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**17 Apr 2018**	**0089_SD346_180417**	**Normal**	**209522**	<0.0001	<0.0001	<0.0001	<0.0001	0.0007	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
Accommodation Area	**SD346**	**08 Jan 2020**	**0089_SD346_200109**	**Normal**	**EP2000187**	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**01 Apr 2020**	**0089_SD346_0.30-0.40_200401**	**Normal**	**EP2003415**	<0.0002	<0.0002	<0.0002	<0.0002	0.0009	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**15 Jul 2020**	**0089_SD346_200715**	**Normal**	**EP2007387**	<0.0002	<0.0002	<0.0002	<0.0002	0.0012	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**22 Sep 2020**	**0089_SD346_200922**	**Normal**	**EP2010144**	<0.0002	<0.0002	0.0002	<0.0002	0.0114	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**15 Dec 2020**	**0089_SD346_201215**	**Normal**	**EP2014043**	<0.0002	<0.0002	0.0002	<0.0002	0.0094	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**17 Mar 2021**	**0089_SD346_210317**	**Normal**	**EP2102902**	<0.0002	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**10 Jun 2021**	**0089_SD346_210610**	**Normal**	**EP2106581**	<0.0002	<0.0002	<0.0002	<0.0002	0.0028	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**30 Aug 2021**	**0089_QC105_210830**	**Field Duplicate**	**EP2110018**	<0.0002	<0.0002	<0.0002	<0.0002	0.0022	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**30 Aug 2021**	**0089_QC205_210830**	**Interlab Duplicate**	**820919**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Accommodation Area	**SD346**	**30 Aug 2021**	**0089_SD346_210830**	**Normal**	**EP2110018**	<0.0002	<0.0002	<0.0002	<0.0002	0.0024	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**12 Jan 2022**	**0089_QC117_220112**	**Field Duplicate**	**EP2200290**	<0.0002	<0.0002	<0.0002	<0.0002	0.0070	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**12 Jan 2022**	**0089_QC217_220112**	**Interlab Duplicate**	**855202**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Accommodation Area	**SD346**	**12 Jan 2022**	**0089_SD346_220112**	**Normal**	**EP2200290**	<0.0002	<0.0002	0.0003	<0.0002	0.0029	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**18 Mar 2022**	**0089_SD346_220318**	**Normal**	**EP2203196**	<0.0002	<0.0002	0.0024	<0.0002	0.0153	<0.0002	<0.001	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**08 Jun 2022**	**0089_SD346_220608**	**Normal**	**EP2206972**	<0.0002	<0.0002	<0.0002	<0.0002	0.0019	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**06 Sep 2022**	**0089_SD346_220906**	**Normal**	**EP2211393**	<0.0002	<0.0002	<0.0002	<0.0002	0.0025	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**12 Dec 2022**	**0089_SD346_221212**	**Normal**	**EP2216880**	<0.0002	<0.0002	0.0002	<0.0002	0.0097	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**14 Mar 2023**	**0089_QC117_230314**	**Field Duplicate**	**EP2303180**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**14 Mar 2023**	**0089_QC217_230314**	**Interlab Duplicate**	**972487**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Accommodation Area	**SD346**	**14 Mar 2023**	**0089_SD346_230314**	**Normal**	**EP2303180**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**07 Jun 2023**	**0089_SD346_230607**	**Normal**	**EP2307501**	<0.0002	<0.0002	<0.0002	<0.0002	0.0009	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accommodation Area	**SD346**	**05 Sep 2023**	**0089_SD346_230905**	**Normal**	**EP2312180**	<0.0002	<0.0002	<0.0002	<0.0002	0.0013	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**19 Apr 2018**	**0089_SD350_180419**	**Normal**	**209623**	<0.0001	<0.0001	<0.0001	<0.0001	0.0005	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
WWTP	**SD350**	**30 Jan 2020**	**0089_SD350_200130**	**Normal**	**EP2001005**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**02 Apr 2020**	**0089_SD350_200402**	**Normal**	**EP2003477**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**21 Jul 2020**	**0089_SD350_200721**	**Normal**	**EP2007603**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**23 Sep 2020**	**0089_SD350_200923**	**Normal**	**EP2010219**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**16 Dec 2020**	**0089_SD350_201216**	**Normal**	**EP2014091**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**17 Mar 2021**	**0089_SD350_210317**	**Normal**	**EP2102888**	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**08 Jun 2021**	**0089_SD350_210608**	**Normal**	**EP2106466**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**30 Aug 2021**	**0089_SD350_210830**	**Normal**	**EP2110018**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**11 Jan 2022**	**0089_SD350_220111**	**Normal**	**EP2200279**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**14 Mar 2022**	**0089_SD350_220314**	**Normal**	**EP2202979**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**07 Jun 2022**	**0089_SD350_220607**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**07 Sep 2022**	**0089_SD350_220907**	**Normal**	**EP2211497**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**12 Dec 2022**	**0089_SD350_221212**	**Normal**	**EP2216875**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**15 Mar 2023**	**0089_SD350_230315**	**Normal**	**EP2303228**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**07 Jun 2023**	**0089_SD350_230607**	**Normal**	**EP2307495**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**05 Sep 2023**	**0089_SD350_230905**	**Normal**	**EP2312186**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**19 Apr 2018**	**0089_SD351_180419**	**Normal**	**209623**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
WWTP	**SD351**	**30 Jan 2020**	**0089_SD351_200130**	**Normal**	**EP2001005**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**02 Apr 2020**	**0089_SD351_0.80-0.90_200402**	**Normal**	**EP2003475**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**21 Jul 2020**	**0089_SD351_200721**	**Normal**	**EP2007603**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**23 Sep 2020**	**0089_SD351_200923**	**Normal**	**EP2010219**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**16 Dec 2020**	**0089_SD351_201216**	**Normal**	**EP2014091**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**17 Mar 2021**	**0089_SD351_210317**	**Normal**	**EP2102888**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**08 Jun 2021**	**0089_SD351_210608**	**Normal**	**EP2106466**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**30 Aug 2021**	**0089_SD351_210830**	**Normal**	**EP2110018**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**11 Jan 2022**	**0089_SD351_220111**	**Normal**	**EP2200279**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**14 Mar 2022**	**0089_SD351_220314**	**Normal**	**EP2202979**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**07 Jun 2022**	**0089_SD351_220607**	**Normal**	**EP2206885**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**07 Sep 2022**	**0089_SD351_220907**	**Normal**	**EP2211499**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**12 Dec 2022**	**0089_SD351_221212**	**Normal**	**EP2216874**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**15 Mar 2023**	**0089_SD351_230315**	**Normal**	**EP2303228**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**07 Jun 2023**	**0089_SD351_230607**	**Normal**	**EP2307495**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**05 Sep 2023**	**0089_SD351_230905**	**Normal**	**EP2312190**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**19 Apr 2018**	**0089_SD352_180419**	**Normal**	**209623**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
WWTP	**SD352**	**30 Jan 2020**	**0089_SD352_200130**	**Normal**	**EP2001005**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**21 Jul 2020**	**0089_SD352_200721**	**Normal**	**EP2007596**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**23 Sep 2020**	**0089_SD352_200923**	**Normal**	**EP2010219**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**16 Dec 2020**	**0089_SD352_201216**	**Normal**	**EP2014091**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**17 Mar 2021**	**0089_SD352_210317**	**Normal**	**EP2102888**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**08 Jun 2021**	**0089_SD352_210608**	**Normal**	**EP2106466**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**30 Aug 2021**	**0089_SD352_210830**	**Normal**	**EP2110018**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**11 Jan 2022**	**0089_SD352_220111**	**Normal**	**EP2200279**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**14 Mar 2022**	**0089_SD352_220314**	**Normal**	**EP2202979**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**07 Jun 2022**	**0089_SD352_220607**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**07 Sep 2022**	**0089_SD352_220907**	**Normal**	**EP2211499**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**12 Dec 2022**	**0089_SD352_221212**	**Normal**	**EP2216874**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**15 Mar 2023**	**0089_SD352_230315**	**Normal**	**EP2303228**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**07 Jun 2023**	**0089_SD352_230607**	**Normal**	**EP2307495**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**05 Sep 2023**	**0089_SD352_230905**	**Normal**	**EP2312190**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**12 Apr 2018**	**0089_QC1SD_180412**	**Field Duplicate**	**209345**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
Demolition Grounds	**SD356**	**12 Apr 2018**	**0089_QC2SD_180412**	**Interlab Duplicate**	**594110**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Demolition Grounds	**SD356**	**12 Apr 2018**	**0089_SD356_180412**	**Normal**	**209345**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
Demolition Grounds	**SD356**	**10 Jan 2020**	**0089_SD356_200110**	**Normal**	**EP2000253**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**30 Mar 2020**	**0089_SD356_200330_0.50-0.60_20033**	**Normal**	**EP2003310**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**20 Jul 2020**	**0089_SD356_200720**	**Normal**	**EP2007546**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**23 Sep 2020**	**0089_SD356_200923**	**Normal**	**EP2010221**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.

Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
Demolition Grounds	**SD356**	**16 Mar 2021**	**0089_SD356_210316**	**Normal**	**EP2102838**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**08 Jun 2021**	**0089_SD356_210608**	**Normal**	**EP2106466**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**30 Aug 2021**	**0089_QC109_210830**	**Field Duplicate**	**EP2110018**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**30 Aug 2021**	**0089_QC209_210830**	**Interlab Duplicate**	**820919**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Demolition Grounds	**SD356**	**30 Aug 2021**	**0089_SD356_210830**	**Normal**	**EP2110018**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**10 Jan 2022**	**0089_SD356_220110**	**Normal**	**EP2200219**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**15 Mar 2022**	**0089_QC112_220315**	**Field Duplicate**	**EP2203020**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**15 Mar 2022**	**0089_QC212_220315**	**Interlab Duplicate**	**872903**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Demolition Grounds	**SD356**	**15 Mar 2022**	**0089_SD356_220315**	**Normal**	**EP2203020**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**08 Jun 2022**	**0089_SD356_220608**	**Normal**	**EP2206968**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**05 Sep 2022**	**0089_SD356_220905**	**Normal**	**EP2211348**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**12 Dec 2022**	**0089_SD356_221212**	**Normal**	**EP2216874**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**15 Mar 2023**	**0089_SD356_230315**	**Normal**	**EP2303228**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**07 Jun 2023**	**0089_QC114_230607**	**Field Duplicate**	**EP2307499**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**07 Jun 2023**	**0089_QC214_230607**	**Interlab Duplicate**	**997465**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Demolition Grounds	**SD356**	**07 Jun 2023**	**0089_SD356_230607**	**Normal**	**EP2307499**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD356**	**11 Sep 2023**	**0089_SD356_230911**	**Normal**	**EP2312526**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**12 Apr 2018**	**0089_SD357_180412**	**Normal**	**209345**	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
Demolition Grounds	**SD357**	**10 Jan 2020**	**0089_SD357_200110**	**Normal**	**EP2000253**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**30 Mar 2020**	**0089_SD357_200330_0.40-0.60_20033**	**Normal**	**EP2003310**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**20 Jul 2020**	**0089_SD357_200720**	**Normal**	**EP2007546**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**23 Sep 2020**	**0089_SD357_200923**	**Normal**	**EP2010221**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**14 Dec 2020**	**0089_SD357_201214**	**Normal**	**EP2013974**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**16 Mar 2021**	**0089_SD357_210316**	**Normal**	**EP2102838**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**08 Jun 2021**	**0089_SD357_210608**	**Normal**	**EP2106466**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**30 Aug 2021**	**0089_SD357_210830**	**Normal**	**EP2110018**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**10 Jan 2022**	**0089_SD357_220110**	**Normal**	**EP2200219**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**15 Mar 2022**	**0089_SD357_220315**	**Normal**	**EP2203020**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**08 Jun 2022**	**0089_SD357_220608**	**Normal**	**EP2206968**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**05 Sep 2022**	**0089_QC107_220905**	**Field Duplicate**	**EP2211348**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**05 Sep 2022**	**0089_QC207_220905**	**Interlab Duplicate**	**920981**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Demolition Grounds	**SD357**	**05 Sep 2022**	**0089_SD357_220905**	**Normal**	**EP2211348**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**12 Dec 2022**	**0089_SD357_221212**	**Normal**	**EP2216874**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**15 Mar 2023**	**0089_SD357_230315**	**Normal**	**EP2303228**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**07 Jun 2023**	**0089_SD357_230607**	**Normal**	**EP2307499**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD357**	**11 Sep 2023**	**0089_SD357_230911**	**Normal**	**EP2312526**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**12 Apr 2018**	**0089_SD358_180412**	**Normal**	**209345**	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
Demolition Grounds	**SD358**	**10 Jan 2020**	**0089_SD358_200110**	**Normal**	**EP2000253**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**30 Mar 2020**	**0089_SD358_200330_0.50-0.60_20033**	**Normal**	**EP2003310**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**20 Jul 2020**	**0089_SD358_200720**	**Normal**	**EP2007546**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**23 Sep 2020**	**0089_SD358_200923**	**Normal**	**EP2010219**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**14 Dec 2020**	**0089_SD358_0.30_201214**	**Normal**	**EP2013990**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**16 Mar 2021**	**0089_SD358_210316**	**Normal**	**EP2102838**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**08 Jun 2021**	**0089_QC108_210608**	**Field Duplicate**	**EP2106466**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**08 Jun 2021**	**0089_QC208_210608**	**Interlab Duplicate**	**802464**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Demolition Grounds	**SD358**	**08 Jun 2021**	**0089_SD358_210608**	**Normal**	**EP2106466**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**30 Aug 2021**	**0089_SD358_210830**	**Normal**	**EP2110018**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**10 Jan 2022**	**0089_SD358_220110**	**Normal**	**EP2200219**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**15 Mar 2022**	**0089_SD358_220315**	**Normal**	**EP2203020**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**08 Jun 2022**	**0089_SD358_220608**	**Normal**	**EP2206968**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**05 Sep 2022**	**0089_SD358_220905**	**Normal**	**EP2211348**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**12 Dec 2022**	**0089_SD358_221212**	**Normal**	**EP2216874**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**15 Mar 2023**	**0089_SD358_230315**	**Normal**	**EP2303228**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**07 Jun 2023**	**0089_SD358_230607**	**Normal**	**EP2307499**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition Grounds	**SD358**	**11 Sep 2023**	**0089_SD358_230911**	**Normal**	**EP2312526**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**13 Apr 2018**	**0089_SD362_180413**	**Normal**	**209417**	<0.0001	<0.0001	<0.0001	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
FTA	**SD362**	**08 Jan 2020**	**0089_SD362_200108**	**Normal**	**EP2000181**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**31 Mar 2020**	**0089_SD362_200331**	**Normal**	**EP2003365**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**15 Jul 2020**	**0089_QC102_200715**	**Field Duplicate**	**EP2007384**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**15 Jul 2020**	**0089_QC202_200215**	**Interlab Duplicate**	**732844**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	**SD362**	**15 Jul 2020**	**0089_SD362_200715**	**Normal**	**EP2007384**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**22 Sep 2020**	**0089_SD362_200922**	**Normal**	**EP2010152**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**14 Dec 2020**	**0089_SD362_201214**	**Normal**	**EP2013987**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**15 Mar 2021**	**0089_SD362_210315**	**Normal**	**EP2102757**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**08 Jun 2021**	**0089_SD362_210608**	**Normal**	**EP2106449**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**30 Aug 2021**	**0089_SD362_210830**	**Normal**	**EP2110023**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**10 Jan 2022**	**0089_SD362_220110**	**Normal**	**EP2200213**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**14 Mar 2022**	**0089_SD362_220314**	**Normal**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**07 Jun 2022**	**0089_SD362_220607**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**05 Sep 2022**	**0089_SD362_220905**	**Normal**	**EP2211346**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**13 Mar 2023**	**0089_SD362_230313**	**Normal**	**EP2303087**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**07 Jun 2023**	**0089_SD362_230607**	**Normal**	**EP2307501**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD362**	**05 Sep 2023**	**0089_SD362_230905**	**Normal**	**EP2312190**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**13 Apr 2018**	**0089_SD363_180413**	**Normal**	**209417**	<0.0001	<0.0001	<0.0001	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
FTA	**SD363**	**08 Jan 2020**	**0089_SD363_200108**	**Normal**	**EP2000181**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**31 Mar 2020**	**0089_SD363_200331**	**Normal**	**EP2003365**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**15 Jul 2020**	**0089_SD363_200715**	**Normal**	**EP2007384**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**22 Sep 2020**	**0089_SD363_200922**	**Normal**	**EP2010152**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**14 Dec 2020**	**0089_SD363_201214**	**Normal**	**EP2013987**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**15 Mar 2021**	**0089_SD363_210315**	**Normal**	**EP2102754**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**08 Jun 2021**	**0089_SD363_210608**	**Normal**	**EP2106449**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**30 Aug 2021**	**0089_SD363_210830**	**Normal**	**EP2110023**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**10 Jan 2022**	**0089_SD363_220110**	**Normal**	**EP2200213**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**14 Mar 2022**	**0089_SD363_220314**	**Normal**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**07 Jun 2022**	**0089_SD363_220607**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**05 Sep 2022**	**0089_QC112_220905**	**Field Duplicate**	**EP2211342**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**05 Sep 2022**	**0089_QC212_220905**	**Interlab Duplicate**	**920981**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	**SD363**	**05 Sep 2022**	**0089_SD363_220905**	**Normal**	**EP2211346**	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	**SD363**	**12 Dec 2022**	**0089_SD363_

Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
FTA	SD363	13 Mar 2023	0089_QC112_230313	Field Duplicate	EP2303087	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD363	13 Mar 2023	0089_QC212_230313	Interlab Duplicate	972487	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	SD363	13 Mar 2023	0089_SD363_230313	Normal	EP2303087	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD363	07 Jun 2023	0089_SD363_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD363	05 Sep 2023	0089_SD363_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	13 Apr 2018	0089_SD364_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0002	0.0006	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
FTA	SD364	09 Jan 2020	0089_SD364_0.40-0.50_200109	Normal	EP2000250	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	30 Mar 2020	0089_QC106_200330	Field Duplicate	EP2003315	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	30 Mar 2020	0089_QC206_200330	Interlab Duplicate	711144	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	SD364	30 Mar 2020	0089_SD364_200330	Normal	EP2003315	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	15 Jul 2020	0089_SD364_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	22 Sep 2020	0089_SD364_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	14 Dec 2020	0089_SD364_201214	Normal	EP2013986	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	15 Mar 2021	0089_SD364_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	08 Jun 2021	0089_SD364_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	30 Aug 2021	0089_SD364_210830	Normal	EP2110022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	10 Jan 2022	0089_SD364_220110	Normal	EP2200217	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	14 Mar 2022	0089_SD364_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	07 Jun 2022	0089_SD364_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	05 Sep 2022	0089_SD364_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	12 Dec 2022	0089_QC102_221212	Field Duplicate	EP2216880	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	12 Dec 2022	0089_QC202_221212	Interlab Duplicate	950091	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	SD364	12 Dec 2022	0089_SD364_221212	Normal	EP2216880	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	13 Mar 2023	0089_SD364_230313	Normal	EP2303087	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	07 Jun 2023	0089_QC117_230607	Field Duplicate	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	07 Jun 2023	0089_QC217_230607	Interlab Duplicate	997465	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	SD364	07 Jun 2023	0089_SD364_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	05 Sep 2023	0089_QC113_230905	Field Duplicate	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	05 Sep 2023	0089_QC213_230905	Interlab Duplicate	1023399	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
FTA	SD364	05 Sep 2023	0089_SD364_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	17 Apr 2018	0089_SD367_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	0.0011	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
WWTP	SD367	08 Jan 2020	0089_SD367_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	31 Mar 2020	0089_SD367_0.40-0.50_200331	Normal	EP2003371	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	15 Jul 2020	0089_SD367_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	22 Sep 2020	0089_SD367_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	15 Dec 2020	0089_SD367_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0002	0.0007	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	15 Mar 2021	0089_SD367_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	09 Jun 2021	0089_SD367_210609	Normal	EP2106518	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	01 Sep 2021	0089_SD367_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	11 Jan 2022	0089_QC114_220111	Field Duplicate	EP2200242	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	11 Jan 2022	0089_QC214_220111	Interlab Duplicate	855202	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WWTP	SD367	11 Jan 2022	0089_SD367_220111	Normal	EP2200242	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	14 Mar 2022	0089_QC110_220314	Field Duplicate	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	14 Mar 2022	0089_QC210_220314	Interlab Duplicate	872911	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WWTP	SD367	14 Mar 2022	0089_SD367_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	07 Jun 2022	0089_SD367_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	05 Sep 2022	0089_QC109_220905	Field Duplicate	EP2211342	<0.0002	<0.0002	<0.0002	<0.0002	0.0011	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	05 Sep 2022	0089_QC209_220905	Interlab Duplicate	920981	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WWTP	SD367	05 Sep 2022	0089_SD367_220905	Normal	EP2211342	<0.0002	<0.0002	<0.0002	<0.0002	0.0011	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	13 Dec 2022	0089_SD367_221212	Normal	EP2216931	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	14 Mar 2023	0089_SD367_230314	Normal	EP2303176	<0.0002	<0.0002	<0.0002	<0.0002	0.0007	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	07 Jun 2023	0089_SD367_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	05 Sep 2023	0089_SD367_230905	Normal	EP2312171	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	17 Apr 2018	0089_SD368_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
WWTP	SD368	08 Jan 2020	0089_SD368_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	01 Apr 2020	0089_SD368_0.30-0.40_200401	Normal	EP2003415	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	20 Jul 2020	0089_SD368_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	22 Sep 2020	0089_SD368_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	15 Dec 2020	0089_SD368_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	15 Mar 2021	0089_QC101_210315	Field Duplicate	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	15 Mar 2021	0089_QC201_210315	Interlab Duplicate	781350	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WWTP	SD368	15 Mar 2021	0089_SD368_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	10 Jun 2021	0089_SD368_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0002	0.0010	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	01 Sep 2021	0089_SD368_210901	Normal	EP2110157	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	11 Jan 2022	0089_SD368_220111	Normal	EP2200242	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	18 Mar 2022	0089_SD368_220318	Normal	EP2203196	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	08 Jun 2022	0089_SD368_220608	Normal	EP2206972	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	05 Sep 2022	0089_SD368_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	12 Dec 2022	0089_QC117_221212	Field Duplicate	EP2216880	<0.0002	<0.0002	<0.0002	<0.0002	0.0009	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	12 Dec 2022	0089_QC217_221212	Interlab Duplicate	950091	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WWTP	SD368	12 Dec 2022	0089_SD368_221212	Normal	EP2216880	<0.0002	<0.0002	<0.0002	<0.0002	0.0009	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	13 Mar 2023	0089_SD368_230313	Normal	EP2303087	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	07 Jun 2023	0089_SD368_230607	Normal	EP2307501	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	05 Sep 2023	0089_SD368_230905	Normal	EP2312180	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	17 Apr 2018	0089_SD369_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
WWTP	SD369	09 Jan 2020	0089_SD369_0.40-0.50_200109	Normal	EP2000249	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	31 Mar 2020	0089_SD369_0.40-0.50_200331	Normal	EP2003371	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	15 Jul 2020	0089_SD369_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	24 Sep 2020	0089_SD369_200924	Normal	EP2010272	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	15 Dec 2020	0089_SD369_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	16 Mar 2021	0089_SD369_210316	Normal	EP2102835	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	09 Jun 2021	0089_SD369_210609	Normal	EP2106518	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	01 Sep 2021	0089_SD369_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	10 Jan 2022	0089_SD369_220110	Normal	EP2200217	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	14 Mar 2022	0089_QC109_220314	Field Duplicate	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	14 Mar 2022	0089_QC209_220314	Interlab Duplicate	872911	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WWTP	SD369	14 Mar 2022	0089_SD369_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	07 Jun 2022	0089_QC106_220607	Field Duplicate	EP2206885	<0.0002	<0.0002	<0.0002	<0.0002	0.0019	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	07 Jun 2022	0089_QC206_220607	Interlab Duplicate	896805	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	SD369	07 Jun 2022	0089_SD369_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0002	0.0021	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005

Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
WWTP	**SD369**	**05 Sep 2022**	**0089_SD369_220905**	**Normal**	**EP2211342**	<0.0002	<0.0002	<0.0002	<0.0002	0.0020	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD369**	**13 Dec 2022**	**0089_SD369_221212**	**Normal**	**EP2216931**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD369**	**14 Mar 2023**	**0089_SD369_230314**	**Normal**	**EP2303176**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD369**	**07 Jun 2023**	**0089_QC113_230607**	**Field Duplicate**	**EP2307495**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD369**	**07 Jun 2023**	**0089_QC213_230607**	**Interlab Duplicate**	**997465**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WWTP	**SD369**	**07 Jun 2023**	**0089_SD369_230607**	**Normal**	**EP2307495**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD369**	**05 Sep 2023**	**0089_SD369_230905**	**Normal**	**EP2312171**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**18 Apr 2018**	**0089_SD374_180418**	**Normal**	**209573**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
Dredge spoil and Careening Bay	**SD374**	**08 Jan 2020**	**0089_QC107_200109**	**Field Duplicate**	**EP2000187**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**08 Jan 2020**	**0089_QC207_200108**	**Interlab Duplicate**	**696100**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dredge spoil and Careening Bay	**SD374**	**08 Jan 2020**	**0089_SD374_200109**	**Normal**	**EP2000187**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**30 Mar 2020**	**0089_SD374_0.40-0.50_200330**	**Normal**	**EP2003314**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**21 Jul 2020**	**0089_SD374_200721**	**Normal**	**EP2007603**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**21 Sep 2020**	**0089_QC102_200921**	**Field Duplicate**	**EP2010075**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**21 Sep 2020**	**0089_QC202_200921**	**Interlab Duplicate**	**746269**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dredge spoil and Careening Bay	**SD374**	**21 Sep 2020**	**0089_SD374_200921**	**Normal**	**EP2010075**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**14 Dec 2020**	**0089_SD374_201214**	**Normal**	**EP2013990**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**15 Mar 2021**	**0089_QC105_210315**	**Field Duplicate**	**EP2102757**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**15 Mar 2021**	**0089_QC205_210315**	**Interlab Duplicate**	**781350**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dredge spoil and Careening Bay	**SD374**	**15 Mar 2021**	**0089_SD374_210315**	**Normal**	**EP2102757**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**10 Jun 2021**	**0089_SD374_210610**	**Normal**	**EP2106581**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**01 Sep 2021**	**0089_SD374_210901**	**Normal**	**EP2110156**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**13 Jan 2022**	**0089_SD374_220113**	**Normal**	**EP2200341**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**16 Mar 2022**	**0089_SD374_220316**	**Normal**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**09 Jun 2022**	**0089_SD374_220609**	**Normal**	**EP2207027**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**06 Sep 2022**	**0089_SD374_220906**	**Normal**	**EP2211393**	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**13 Dec 2022**	**0089_SD374_221212**	**Normal**	**EP2216935**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**14 Mar 2023**	**0089_SD374_230314**	**Normal**	**EP2303180**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**06 Jun 2023**	**0089_QC107_230606**	**Field Duplicate**	**EP2307435**	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**06 Jun 2023**	**0089_QC207_230606**	**Interlab Duplicate**	**997465**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dredge spoil and Careening Bay	**SD374**	**06 Jun 2023**	**0089_SD374_230606**	**Normal**	**EP2307435**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD374**	**04 Sep 2023**	**0089_SD374_230904**	**Normal**	**EP2312228**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**18 Apr 2018**	**0089_SD375_180418**	**Normal**	**209573**	<0.0001	<0.0001	<0.0001	<0.0001	0.0012	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
Dredge spoil and Careening Bay	**SD375**	**08 Jan 2020**	**0089_SD375_200109**	**Normal**	**EP2000187**	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**30 Mar 2020**	**0089_SD375_0.30-0.40_200330**	**Normal**	**EP2003314**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**21 Jul 2020**	**0089_SD375_200721**	**Normal**	**EP2007603**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**21 Sep 2020**	**0089_SD375_200921**	**Normal**	**EP2010075**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**14 Dec 2020**	**0089_SD375_0.30_201214**	**Normal**	**EP2013990**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**15 Mar 2021**	**0089_SD375_210315**	**Normal**	**EP2102757**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**10 Jun 2021**	**0089_SD375_210610**	**Normal**	**EP2106581**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**01 Sep 2021**	**0089_SD375_210901**	**Normal**	**EP2110156**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**13 Jan 2022**	**0089_SD375_220113**	**Normal**	**EP2200341**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**16 Mar 2022**	**0089_SD375_220316**	**Normal**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**09 Jun 2022**	**0089_SD375_220609**	**Normal**	**EP2207027**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**06 Sep 2022**	**0089_SD375_220906**	**Normal**	**EP2211393**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**13 Dec 2022**	**0089_SD375_221212**	**Normal**	**EP2216935**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**14 Mar 2023**	**0089_SD375_230314**	**Normal**	**EP2303180**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**06 Jun 2023**	**0089_SD375_230606**	**Normal**	**EP2307435**	<0.0002	<0.0002	<0.0002	<0.0002	0.0030	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD375**	**04 Sep 2023**	**0089_SD375_230904**	**Normal**	**EP2312228**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**17 Apr 2018**	**0089_SD378_180417**	**Normal**	**209522**	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
Dredge spoil and Careening Bay	**SD378**	**08 Jan 2020**	**0089_SD378_200109**	**Normal**	**EP2000187**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**30 Mar 2020**	**0089_SD378_0.30-0.40_200330**	**Normal**	**EP2003314**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**21 Jul 2020**	**0089_SD378_200721**	**Normal**	**EP2007603**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**21 Sep 2020**	**0089_QC105_200921**	**Field Duplicate**	**EP2010075**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**21 Sep 2020**	**0089_QC205_200921**	**Interlab Duplicate**	**746269**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dredge spoil and Careening Bay	**SD378**	**21 Sep 2020**	**0089_SD378_200921**	**Normal**	**EP2010075**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**14 Dec 2020**	**0089_SD378_201214**	**Normal**	**EP2013990**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**15 Mar 2021**	**0089_SD378_210315**	**Normal**	**EP2102757**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**10 Jun 2021**	**0089_QC117_210610**	**Field Duplicate**	**EP2106581**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**10 Jun 2021**	**0089_QC217_210610**	**Interlab Duplicate**	**802734**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dredge spoil and Careening Bay	**SD378**	**10 Jun 2021**	**0089_SD378_210610**	**Normal**	**EP2106581**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**01 Sep 2021**	**0089_SD378_210901**	**Normal**	**EP2110156**	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**13 Jan 2022**	**0089_SD378_220113**	**Normal**	**EP2200341**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**16 Mar 2022**	**0089_SD378_220316**	**Normal**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**09 Jun 2022**	**0089_SD378_220609**	**Normal**	**EP2207027**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**06 Sep 2022**	**0089_SD378_220906**	**Normal**	**EP2211393**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**13 Dec 2022**	**0089_SD378_221212**	**Normal**	**EP2216935**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**14 Mar 2023**	**0089_SD378_230314**	**Normal**	**EP2303180**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**06 Jun 2023**	**0089_SD378_230606**	**Normal**	**EP2307435**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**04 Sep 2023**	**0089_QC103_230904**	**Field Duplicate**	**EP2312228**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and Careening Bay	**SD378**	**04 Sep 2023**	**0089_QC203_230904**	**Interlab Duplicate**	**1023399**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dredge spoil and Careening Bay	**SD378**	**04 Sep 2023**	**0089_SD378_230904**	**Normal**	**EP2312228**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**19 Apr 2018**	**0089_SD380_180419**	**Normal**	**209623**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
WWTP	**SD380**	**30 Jan 2020**	**0089_SD380_200130**	**Normal**	**EP2001005**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**02 Apr 2020**	**0089_-SD380_0.80-0.90_200402**	**Normal**	**EP2003475**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**21 Jul 2020**	**0089_SD380_200721**	**Normal**	**EP2007603**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**23 Sep 2020**	**0089_SD380_200923**	**Normal**	**EP2010219**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**16 Dec 2020**	**0089_SD380_201216**	**Normal**	**EP2014091**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**17 Mar 2021**	**0089_SD380_210317**	**Normal**	**EP2102888**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**08 Jun 2021**	**0089_SD380_210608**	**Normal**	**EP2106466**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**30 Aug 2021**	**0089_SD380_210830**	**Normal**	**EP2110018**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**11 Jan 2022**	**0089_SD380_220111**	**Normal**	**EP2200279**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**14 Mar 2022**	**0089_SD380_220314**	**Normal**	**EP2202979**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**07 Jun 2022**	**0089_SD380_220607**	**Normal**	**EP2206885**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**07 Sep 2022**	**0089_SD380_220907**	**Normal**	**EP2211499**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**12 Dec 2022**	**0089_SD380_221212**	**Normal**	**EP2216875**	<0.0002	<0.0002	<0.0002	<0.0002

Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
WWTP	SD381	30 Jan 2020	0089_SD381_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	02 Apr 2020	0089_SD381_0.80-0.90_200402	Normal	EP2003475	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	21 Jul 2020	0089_SD381_200721	Normal	EP2007596	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	23 Sep 2020	0089_SD381_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	16 Dec 2020	0089_SD381_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	17 Mar 2021	0089_SD381_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	08 Jun 2021	0089_SD381_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	30 Aug 2021	0089_SD381_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	11 Jan 2022	0089_SD381_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	14 Mar 2022	0089_SD381_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	07 Jun 2022	0089_SD381_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	07 Sep 2022	0089_SD381_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	12 Dec 2022	0089_SD381_221212	Normal	EP2216875	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	15 Mar 2023	0089_SD381_230315	Normal	EP2303228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	07 Jun 2023	0089_SD381_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	05 Sep 2023	0089_SD381_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	19 Apr 2018	0089_SD379_180419	Normal	209623	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
WWTP	SD401	30 Jan 2020	0089_SD401_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	02 Apr 2020	0089_SD401_0.80-0.90_200402	Normal	EP2003475	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	21 Jul 2020	0089_SD401_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	23 Sep 2020	0089_SD401_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	16 Dec 2020	0089_SD401_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	17 Mar 2021	0089_SD401_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	08 Jun 2021	0089_SD401_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	30 Aug 2021	0089_SD401_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	11 Jan 2022	0089_SD401_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	14 Mar 2022	0089_SD401_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	07 Jun 2022	0089_SD401_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	07 Sep 2022	0089_SD401_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	12 Dec 2022	0089_SD401_221212	Normal	EP2216875	<0.0002	<0.0002	<0.0002	<0.0002	0.0015	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	15 Mar 2023	0089_SD401_230315	Normal	EP2303228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	07 Jun 2023	0089_SD401_230607	Normal	EP2307495	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	05 Sep 2023	0089_SD401_230905	Normal	EP2312190	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	14 Jan 2020	0089_SD405_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	01 Apr 2020	0089_SD405_200401	Normal	EP2003419	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	22 Jul 2020	0089_SD405_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	21 Sep 2020	0089_SD405_200921	Normal	EP2010075	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	15 Dec 2020	0089_SD405_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	15 Mar 2021	0089_SD405_210315	Normal	EP2102754	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	10 Jun 2021	0089_QC116_210610	Field Duplicate	EP2106589	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	10 Jun 2021	0089_QC216_210610	Interlab Duplicate	802734	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
HSF	SD405	10 Jun 2021	0089_SD405_210610	Normal	EP2106589	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	31 Aug 2021	0089_SD405_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	14 Jan 2022	0089_SD405_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	16 Mar 2022	0089_SD405_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	07 Jun 2022	0089_SD405_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	07 Sep 2022	0089_SD405_220907	Normal	EP2211497	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	13 Dec 2022	0089_SD405_221212	Normal	EP2216935	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	14 Mar 2023	0089_SD405_230314	Normal	EP2303180	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	08 Jun 2023	0089_SD405_230608	Normal	EP2307591	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	05 Sep 2023	0089_SD405_230905	Normal	EP2312186	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	14 Jan 2020	0089_SD407_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	01 Apr 2020	0089_SD407_200401	Normal	EP2003419	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	02 Apr 2020	0089_SD407_200402	Normal	EP2003477	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	22 Jul 2020	0089_SD407_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	21 Sep 2020	0089_SD407_200921	Normal	EP2010075	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	15 Dec 2020	0089_SD407_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	15 Mar 2021	0089_SD407_210315	Normal	EP2102754	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	10 Jun 2021	0089_SD407_210610	Normal	EP2106589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	31 Aug 2021	0089_SD407_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	14 Jan 2022	0089_SD407_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	16 Mar 2022	0089_SD407_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	07 Jun 2022	0089_QC114_220607	Field Duplicate	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	07 Jun 2022	0089_QC214_220607	Interlab Duplicate	896805	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	SD407	07 Jun 2022	0089_SD407_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	07 Sep 2022	0089_SD407_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	13 Dec 2022	0089_SD407_221212	Normal	EP2216931	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	14 Mar 2023	0089_SD407_230314	Normal	EP2303180	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	08 Jun 2023	0089_SD407_230608	Normal	EP2307591	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	05 Sep 2023	0089_SD407_230905	Normal	EP2312186	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	14 Jan 2020	0089_SD409_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	01 Apr 2020	0089_SD409_200401	Normal	EP2003419	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	21 Jul 2020	0089_SD409_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	22 Sep 2020	0089_SD409_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	15 Dec 2020	0089_SD409_201215	Normal	EP2014043	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	17 Mar 2021	0089_SD409_210317	Normal	EP2102902	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	10 Jun 2021	0089_SD409_210610	Normal	EP2106589	<0.0002	<0.0002	<0.0002	<0.0002	0.0011	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	31 Aug 2021	0089_SD409_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	14 Jan 2022	0089_SD409_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	16 Mar 2022	0089_SD409_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	07 Jun 2022	0089_SD409_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	06 Sep 2022	0089_SD409_220906	Normal	EP2211393	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	13 Dec 2022	0089_SD409_221212	Normal	EP2216935	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	14 Mar 2023	0089_SD409_230314	Normal	EP2303180	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	08 Jun 2023	0089_SD409_230608	Normal	EP2307591	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	04 Sep 2023	0089_QC108_230904	Field Duplicate	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	04 Sep 2023	0089_QC208_230904	Interlab Duplicate	1023399	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
HSF	SD409	04 Sep 2023	0089_SD409_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	14 Jan 2020	0089_SD411_200114	Normal	EP2000423	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	01 Apr 2020	0089_SD411_1.00-1.10_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005

Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
HSF	SD411	21 Jul 2020	0089_SD411_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	22 Sep 2020	0089_SD411_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	15 Dec 2020	0089_SD411_201215	Normal	EP2014043	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	18 Mar 2021	0089_SD411_210318	Normal	EP2102942	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	09 Jun 2021	0089_SD411_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	01 Sep 2021	0089_SD411_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	14 Jan 2022	0089_SD411_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	16 Mar 2022	0089_SD411_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	07 Jun 2022	0089_SD411_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	06 Sep 2022	0089_SD411_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	14 Dec 2022	0089_SD411_221214	Normal	EP2216974	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	15 Mar 2023	0089_SD411_230315	Normal	EP2303228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	08 Jun 2023	0089_SD411_230608	Normal	EP2307594	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	04 Sep 2023	0089_QC111_230904	Field Duplicate	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	04 Sep 2023	0089_QC211_230904	Interlab Duplicate	1023399	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
HSF	SD411	04 Sep 2023	0089_SD411_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	14 Jan 2020	0089_SD413_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	01 Apr 2020	0089_SD413_0.60-0.70_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	21 Jul 2020	0089_SD413_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	22 Sep 2020	0089_SD413_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	15 Dec 2020	0089_SD413_201215	Normal	EP2014043	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	18 Mar 2021	0089_SD413_210318	Normal	EP2102942	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	09 Jun 2021	0089_SD413_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	01 Sep 2021	0089_SD413_210901	Normal	EP2110157	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	14 Jan 2022	0089_SD413_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	16 Mar 2022	0089_SD413_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	07 Jun 2022	0089_SD413_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	06 Sep 2022	0089_SD413_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	14 Dec 2022	0089_SD413_221214	Normal	EP2216974	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	15 Mar 2023	0089_SD413_230315	Normal	EP2303228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	08 Jun 2023	0089_SD413_230608	Normal	EP2307594	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	04 Sep 2023	0089_SD413_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	14 Jan 2020	0089_SD415_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	01 Apr 2020	0089_SD415_0.50-0.60_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	21 Jul 2020	0089_SD415_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	22 Sep 2020	0089_SD415_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	15 Dec 2020	0089_SD415_201215	Normal	EP2014043	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	18 Mar 2021	0089_SD415_210318	Normal	EP2102942	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	09 Jun 2021	0089_SD415_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	01 Sep 2021	0089_SD415_210901	Normal	EP2110157	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	14 Jan 2022	0089_SD415_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	16 Mar 2022	0089_SD415_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	07 Jun 2022	0089_SD415_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	06 Sep 2022	0089_SD415_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	14 Dec 2022	0089_SD415_221214	Normal	EP2216974	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	15 Mar 2023	0089_SD415_230315	Normal	EP2303228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	08 Jun 2023	0089_SD415_230608	Normal	EP2307594	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	04 Sep 2023	0089_SD415_230904	Normal	EP2312228	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005

Notes:

First Time detection of PFOA or PFHxS+PFOS

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
WWTP	SD304	17 Apr 2018	0089_SD304_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
WWTP	SD304	08 Jan 2020	0089_SD304_200109	Normal	EP2000187	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD304	01 Apr 2020	0089_SD304_0.40-0.50_200401	Normal	EP2003415	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	SD304	20 Jul 2020	0089_SD304_200720	Normal	EP2007546	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD304	22 Sep 2020	0089_SD304_200922	Normal	EP2010144	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD304	15 Dec 2020	0089_SD304_201215	Normal	EP2014049	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD304	15 Mar 2021	0089_SD304_210315	Normal	EP2102757	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD304	10 Jun 2021	0089_SD304_210610	Normal	EP2106581	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
WWTP	SD304	01 Sep 2021	0089_SD304_210901	Normal	EP2110157	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD304	11 Jan 2022	0089_SD304_220111	Normal	EP2200242	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD304	18 Mar 2022	0089_SD304_220318	Normal	EP2203196	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD304	08 Jun 2022	0089_SD304_220608	Normal	EP2206972	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD304	05 Sep 2022	0089_SD304_220905	Normal	EP2211346	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD304	12 Dec 2022	0089_SD304_221212	Normal	EP2216880	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD304	13 Mar 2023	0089_SD304_230313	Normal	EP2303087	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	SD304	07 Jun 2023	0089_SD304_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD304	05 Sep 2023	0089_SD304_230905	Normal	EP2312180	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	18 Apr 2018	0089_SD306_180418	Normal	209573	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
HSF	SD306	10 Jan 2020	0089_SD306_200110	Normal	EP2000288	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	31 Mar 2020	0089_SD306_200331_1.00-1.20_20033	Normal	EP2003368	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	22 Jul 2020	0089_SD306_200722	Normal	EP2007650	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	23 Sep 2020	0089_SD306_200923	Normal	EP2010219	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	15 Dec 2020	0089_SD306_201215	Normal	EP2014049	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	17 Mar 2021	0089_SD306_210317	Normal	EP2102888	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	09 Jun 2021	0089_SD306_210609	Normal	EP2106520	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	31 Aug 2021	0089_QC115_210831	Field Duplicate	EP2110074	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	31 Aug 2021	0089_QC215_210831	Interlab Duplicate	821197	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
HSF	SD306	31 Aug 2021	0089_SD306_210831	Normal	EP2110074	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	13 Jan 2022	0089_SD306_220113	Normal	EP2200341	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	16 Mar 2022	0089_SD306_220316	Normal	EP2203059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	07 Jun 2022	0089_SD306_220607	Normal	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	06 Sep 2022	0089_SD306_220906	Normal	EP2211402	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	13 Dec 2022	0089_SD306_221212	Normal	EP2216931	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	14 Mar 2023	0089_SD306_230314	Normal	EP2303176	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	08 Jun 2023	0089_SD306_230608	Normal	EP2307589	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD306	04 Sep 2023	0089_SD306_230904	Normal	EP2312228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	30 Apr 2018	0089_SD307_180430	Normal	209959	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
HSF	SD307	10 Jan 2020	0089_SD307_200110	Normal	EP2000288	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	31 Mar 2020	0089_SD307_200331_1.00-1.20_20033	Normal	EP2003368	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	22 Jul 2020	0089_SD307_200722	Normal	EP2007650	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	23 Sep 2020	0089_SD307_200923	Normal	EP2010221	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	15 Dec 2020	0089_SD307_201215	Normal	EP2014052	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	17 Mar 2021	0089_SD307_210317	Normal	EP2102888	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	09 Jun 2021	0089_SD307_210609	Normal	EP2106520	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	31 Aug 2021	0089_SD307_210831	Normal	EP2110067	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	13 Jan 2022	0089_SD307_220113	Normal	EP2200341	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	16 Mar 2022	0089_SD307_220316	Normal	EP2203059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	07 Jun 2022	0089_SD307_220607	Normal	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	06 Sep 2022	0089_SD307_220906	Normal	EP2211402	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	13 Dec 2022	0089_SD307_221212	Normal	EP2216931	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	14 Mar 2023	0089_SD307_230314	Normal	EP2303176	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	08 Jun 2023	0089_SD307_230608	Normal	EP2307589	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD307	04 Sep 2023	0089_SD307_230904	Normal	EP2312228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	30 Apr 2018	0089_SD308_180430	Normal	209959	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
HSF	SD308	10 Jan 2020	0089_SD308_200110	Normal	EP2000288	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	01 Apr 2020	0089_SD308_1.00-1.20_200401	Normal	EP2003416	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	22 Jul 2020	0089_SD308_200722	Normal	EP2007650	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	23 Sep 2020	0089_SD308_200923	Normal	EP2010219	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	15 Dec 2020	0089_SD308_0.50_201215	Normal	EP2014052	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	17 Mar 2021	0089_QC117_210317	Field Duplicate	EP2102888	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	17 Mar 2021	0089_QC217_210317	Interlab Duplicate	782088	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
HSF	SD308	17 Mar 2021	0089_SD308_210317	Normal	EP2102888	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	09 Jun 2021	0089_SD308_210609	Normal	EP2106520	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	31 Aug 2021	0089_SD308_210831	Normal	EP2110074	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	13 Jan 2022	0089_SD308_220113	Normal	EP2200341	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	16 Mar 2022	0089_SD308_220316	Normal	EP2203059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	07 Jun 2022	0089_SD308_220607	Normal	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	06 Sep 2022	0089_SD308_220906	Normal	EP2211402	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	13 Dec 2022	0089_SD308_221212	Normal	EP2216931	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	14 Mar 2023	0089_SD308_230314	Normal	EP2303176	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	08 Jun 2023	0089_SD308_230608	Normal	EP2307589	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD308	04 Sep 2023	0089_SD308_230904	Normal	EP2312228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	18 Apr 2018	0089_SD314_180418	Normal	209573	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
HSF	SD314	10 Jan 2020	0089_SD314_200110	Normal	EP2000288	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	31 Mar 2020	0089_SD314_200331_0.60-0.80_20033	Normal	EP2003368	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	22 Jul 2020	0089_SD314_200722	Normal	EP2007650	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	23 Sep 2020	0089_SD314_200923	Normal	EP2010221	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	15 Dec 2020	0089_SD314_201215	Normal	EP2014049	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	17 Mar 2021	0089_SD314_210317	Normal	EP2102888	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	09 Jun 2021	0089_SD314_210609	Normal	EP2106520	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	31 Aug 2021	0089_SD314_210831	Normal	EP2110067	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	13 Jan 2022	0089_SD314_220113	Normal	EP2200341	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	16 Mar 2022	0089_SD314_220316	Normal	EP2203059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	07 Jun 2022	0089_QC102_220607	Field Duplicate	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	07 Jun 2022	0089_QC202_220607	Interlab Duplicate	896805	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
HSF	SD314	07 Jun 2022	0089_SD314_220607	Normal	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	06 Sep 2022	0089_SD314_220906	Normal	EP2211402	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	13 Dec 2022	0089_SD314_221212	Normal	EP2216931	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
HSF	SD314	14 Mar 2023	0089_SD314_230314	Normal	EP2303176	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	08 Jun 2023	0089_SD314_230608	Normal	EP2307589	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD314	04 Sep 2023	0089_SD314_230904	Normal	EP2312228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	30 Apr 2018	0089_SD315_180430	Normal	209959	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
HSF	SD315	10 Jan 2020	0089_SD315_200110	Normal	EP2000288	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	01 Apr 2020	0089_SD315_1.00-1.20_200401	Normal	EP2003416	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	22 Jul 2020	0089_SD315_200722	Normal	EP2007650	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	23 Sep 2020	0089_SD315_200923	Normal	EP2010219	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	15 Dec 2020	0089_SD315_201215	Normal	EP2014049	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	17 Mar 2021	0089_SD315_210317	Normal	EP2102888	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	09 Jun 2021	0089_SD315_210609	Normal	EP2106520	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	31 Aug 2021	0089_SD315_210831	Normal	EP2110074	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	13 Jan 2022	0089_SD315_220113	Normal	EP2200341	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	16 Mar 2022	0089_SD315_220316	Normal	EP2203059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	07 Jun 2022	0089_SD315_220607	Normal	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	06 Sep 2022	0089_SD315_220906	Normal	EP2211402	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	13 Dec 2022	0089_SD315_221212	Normal	EP2216931	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	14 Mar 2023	0089_SD315_230314	Normal	EP2303176	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	08 Jun 2023	0089_SD315_230608	Normal	EP2307589	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD315	04 Sep 2023	0089_SD315_230904	Normal	EP2312228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	30 Apr 2018	0089_SD316_180430	Normal	209959	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
HSF	SD316	10 Jan 2020	0089_SD316_200110	Normal	EP2000288	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	01 Apr 2020	0089_SD316_1.20-1.40_200401	Normal	EP2003416	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	22 Jul 2020	0089_SD316_200722	Normal	EP2007650	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	23 Sep 2020	0089_SD316_200923	Normal	EP2010219	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	15 Dec 2020	0089_SD316_201215	Normal	EP2014052	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	17 Mar 2021	0089_SD316_210317	Normal	EP2102888	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	09 Jun 2021	0089_SD316_210609	Normal	EP2106520	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	31 Aug 2021	0089_SD316_210831	Normal	EP2110067	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	13 Jan 2022	0089_SD316_220113	Normal	EP2200341	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	16 Mar 2022	0089_SD316_220316	Normal	EP2203059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	07 Jun 2022	0089_SD316_220607	Normal	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	06 Sep 2022	0089_SD316_220906	Normal	EP2211402	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	13 Dec 2022	0089_SD316_221212	Normal	EP2216931	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	14 Mar 2023	0089_SD316_230314	Normal	EP2303176	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	08 Jun 2023	0089_SD316_230608	Normal	EP2307589	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD316	04 Sep 2023	0089_SD316_230904	Normal	EP2312228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	12 Apr 2018	0089_SD329_180412	Normal	209345	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
Demolition Grounds	SD329	10 Jan 2020	0089_SD329_200110	Normal	EP2000253	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	30 Mar 2020	0089_SD329_200330_0.50-0.60_20033	Normal	EP2003310	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	20 Jul 2020	0089_SD329_200720	Normal	EP2007546	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	23 Sep 2020	0089_SD329_200923	Normal	EP2010219	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	14 Dec 2020	0089_QC101_201214	Field Duplicate	EP2013974	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	14 Dec 2020	0089_QC201_201114	Interlab Duplicate	765054	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition Grounds	SD329	14 Dec 2020	0089_SD329_201214	Normal	EP2013974	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	16 Mar 2021	0089_SD329_210316	Normal	EP2102838	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	08 Jun 2021	0089_QC104_210608	Field Duplicate	EP2106466	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	08 Jun 2021	0089_QC204_210608	Interlab Duplicate	802464	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition Grounds	SD329	08 Jun 2021	0089_SD329_210608	Normal	EP2106466	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	30 Aug 2021	0089_SD329_210830	Normal	EP2110018	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	10 Jan 2022	0089_QC109_220110	Field Duplicate	EP2200219	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	10 Jan 2022	0089_QC209_220110	Interlab Duplicate	854607	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition Grounds	SD329	10 Jan 2022	0089_SD329_220110	Normal	EP2200219	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	15 Mar 2022	0089_QC115_220315	Field Duplicate	EP2203020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	15 Mar 2022	0089_QC215_220315	Interlab Duplicate	872903	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition Grounds	SD329	15 Mar 2022	0089_SD329_220315	Normal	EP2203020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	08 Jun 2022	0089_SD329_220608	Normal	EP2206968	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	05 Sep 2022	0089_SD329_220905	Normal	EP2211348	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	12 Dec 2022	0089_SD329_221212	Normal	EP2216874	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	15 Mar 2023	0089_SD329_230315	Normal	EP2303228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	07 Jun 2023	0089_SD329_230607	Normal	EP2307499	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD329	11 Sep 2023	0089_SD329_230911	Normal	EP2312526	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	12 Apr 2018	0089_SD330_180412	Normal	209345	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
Demolition Grounds	SD330	10 Jan 2020	0089_SD330_200110	Normal	EP2000253	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	30 Mar 2020	0089_SD330_200330_0.50-0.60_20033	Normal	EP2003310	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	20 Jul 2020	0089_SD330_200720	Normal	EP2007546	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	22 Sep 2020	0089_SD330_200922	Normal	EP2010152	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	14 Dec 2020	0089_SD330_201214	Normal	EP2013990	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	16 Mar 2021	0089_SD330_210316	Normal	EP2102838	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	08 Jun 2021	0089_SD330_210608	Normal	EP2106466	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	30 Aug 2021	0089_SD330_210830	Normal	EP2110018	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	10 Jan 2022	0089_SD330_220110	Normal	EP2200219	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	15 Mar 2022	0089_SD330_220315	Normal	EP2203020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	08 Jun 2022	0089_SD330_220608	Normal	EP2206968	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	05 Sep 2022	0089_SD330_220905	Normal	EP2211348	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	12 Dec 2022	0089_QC106_221212	Field Duplicate	EP2216874	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	12 Dec 2022	0089_QC206_221212	Interlab Duplicate	950091	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition Grounds	SD330	12 Dec 2022	0089_SD330_221212	Normal	EP2216874	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	15 Mar 2023	0089_SD330_230315	Normal	EP2303228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	07 Jun 2023	0089_SD330_230607	Normal	EP2307499	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD330	11 Sep 2023	0089_SD330_230911	Normal	EP2312526	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	12 Apr 2018	0089_SD331_180412	Normal	209345	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
Demolition Grounds	SD331	10 Jan 2020	0089_SD331_200110	Normal	EP2000253	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	30 Mar 2020	0089_SD331_200330_0.30-0.50_20033	Normal	EP2003310	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	20 Jul 2020	0089_SD331_200720	Normal	EP2007546	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	23 Sep 2020	0089_SD331_200923	Normal	EP2010221	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	14 Dec 2020	0089_QC103_201214	Field Duplicate	EP2013974	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	14 Dec 2020	0089_QC203_201114	Interlab Duplicate	765054	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition Grounds	SD331	14 Dec 2020	0089_SD331_201214	Normal	EP2013974	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	16 Mar 2021	0089_SD331_210316	Normal	EP2102838	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
Demolition Grounds	SD331	08 Jun 2021	0089_SD331_210608	Normal	EP2106466	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	30 Aug 2021	0089_SD331_210830	Normal	EP2110018	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	10 Jan 2022	0089_SD331_220110	Normal	EP2200219	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	15 Mar 2022	0089_SD331_220315	Normal	EP2203020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	08 Jun 2022	0089_SD331_220608	Normal	EP2206968	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	05 Sep 2022	0089_SD331_220905	Normal	EP2211348	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	12 Dec 2022	0089_SD331_221212	Normal	EP2216874	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	15 Mar 2023	0089_SD331_230315	Normal	EP2303228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	07 Jun 2023	0089_SD331_230607	Normal	EP2307499	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	SD331	11 Sep 2023	0089_SD331_230911	Normal	EP2312526	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	13 Apr 2018	0089_QC1SD_180413	Field Duplicate	209417	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
FTA	SD335	13 Apr 2018	0089_QC2SD_180413	Interlab Duplicate	594110	<0.001	<0.005	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05
FTA	SD335	13 Apr 2018	0089_SD335_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
FTA	SD335	09 Jan 2020	0089_SD335_0.40-0.50_200109	Normal	EP2000250	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	30 Mar 2020	0089_SD335_0.50_200330	Normal	EP2003315	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	15 Jul 2020	0089_QC101_200715	Field Duplicate	EP2007384	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	15 Jul 2020	0089_QC201_200215	Interlab Duplicate	732844	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD335	15 Jul 2020	0089_SD335_200715	Normal	EP2007384	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	22 Sep 2020	0089_SD335_200922	Normal	EP2010152	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	14 Dec 2020	0089_SD335_201214	Normal	EP2013986	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	15 Mar 2021	0089_SD335_210315	Normal	EP2102754	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
FTA	SD335	08 Jun 2021	0089_SD335_210608	Normal	EP2106466	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	30 Aug 2021	0089_SD335_210830	Normal	EP2110022	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	10 Jan 2022	0089_QC103_220110	Field Duplicate	EP2200217	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	10 Jan 2022	0089_QC203_220110	Interlab Duplicate	854607	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD335	10 Jan 2022	0089_SD335_220110	Normal	EP2200217	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	14 Mar 2022	0089_SD335_220314	Normal	EP2202978	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	07 Jun 2022	0089_QC113_220607	Field Duplicate	EP2206882	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
FTA	SD335	07 Jun 2022	0089_QC213_220607	Interlab Duplicate	896805	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
FTA	SD335	07 Jun 2022	0089_SD335_220607	Normal	EP2206882	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
FTA	SD335	05 Sep 2022	0089_SD335_220905	Normal	EP2211346	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
FTA	SD335	12 Dec 2022	0089_SD335_221212	Normal	EP2216880	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
FTA	SD335	13 Mar 2023	0089_QC104_230313	Field Duplicate	EP2303087	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	13 Mar 2023	0089_QC204_230313	Interlab Duplicate	972487	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD335	13 Mar 2023	0089_SD335_230313	Normal	EP2303087	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	07 Jun 2023	0089_SD335_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD335	05 Sep 2023	0089_SD335_230905	Normal	EP2312190	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	13 Apr 2018	0089_SD340_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
FTA	SD340	09 Jan 2020	0089_SD340_0.40-0.50_200109	Normal	EP2000250	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	30 Mar 2020	0089_QC108_200330	Field Duplicate	EP2003315	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	13 Apr 2018	0089_SD340_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
FTA	SD340	09 Jan 2020	0089_SD340_0.40-0.50_200109	Normal	EP2000250	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	30 Mar 2020	0089_QC108_200330	Field Duplicate	EP2003315	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	30 Mar 2020	0089_QC208_200330	Interlab Duplicate	711144	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD340	30 Mar 2020	0089_SD340_200330	Normal	EP2003315	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	15 Jul 2020	0089_SD340_200715	Normal	EP2007384	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	22 Sep 2020	0089_SD340_200922	Normal	EP2010152	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	14 Dec 2020	0089_SD340_201214	Normal	EP2013987	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	15 Mar 2021	0089_SD340_210315	Normal	EP2102757	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	08 Jun 2021	0089_SD340_210608	Normal	EP2106449	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	30 Aug 2021	0089_QC107_210830	Field Duplicate	EP2110023	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	30 Aug 2021	0089_QC207_210830	Interlab Duplicate	820919	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD340	30 Aug 2021	0089_SD340_210830	Normal	EP2110023	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	10 Jan 2022	0089_SD340_220110	Normal	EP2200217	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	14 Mar 2022	0089_SD340_220314	Normal	EP2202978	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	07 Jun 2022	0089_SD340_220607	Normal	EP2206882	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
FTA	SD340	05 Sep 2022	0089_QC105_220905	Field Duplicate	EP2211346	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	05 Sep 2022	0089_QC205_220905	Interlab Duplicate	920981	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD340	05 Sep 2022	0089_SD340_220905	Normal	EP2211346	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	12 Dec 2022	0089_SD340_221212	Normal	EP2216880	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	13 Mar 2023	0089_QC108_230313	Field Duplicate	EP2303087	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD340	13 Mar 2023	0089_QC208_230313	Interlab Duplicate	972487	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD340	13 Mar 2023	0089_SD340_230313	Normal	EP2303087	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
FTA	SD340	07 Jun 2023	0089_SD340_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
FTA	SD340	05 Sep 2023	0089_SD340_230905	Normal	EP2312190	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	13 Apr 2018	0089_SD341_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
FTA	SD341	08 Jan 2020	0089_QC105_200108	Field Duplicate	EP2000181	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	08 Jan 2020	0089_QC205_200108	Interlab Duplicate	696100	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD341	08 Jan 2020	0089_SD341_200108	Normal	EP2000181	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	31 Mar 2020	0089_SD341_200331	Normal	EP2003365	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	15 Jul 2020	0089_SD341_200715	Normal	EP2007384	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	22 Sep 2020	0089_SD341_200922	Normal	EP2010152	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	14 Dec 2020	0089_SD341_201214	Normal	EP2013987	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	15 Mar 2021	0089_SD341_210315	Normal	EP2102754	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	08 Jun 2021	0089_SD341_210608	Normal	EP2106449	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	30 Aug 2021	0089_SD341_210830	Normal	EP2110022	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	10 Jan 2022	0089_SD341_220110	Normal	EP2200213	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	14 Mar 2022	0089_SD341_220314	Normal	EP2202978	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	07 Jun 2022	0089_SD341_220607	Normal	EP2206882	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	05 Sep 2022	0089_SD341_220905	Normal	EP2211346	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
FTA	SD341	12 Dec 2022	0089_QC110_221212	Field Duplicate	EP2216880	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	12 Dec 2022	0089_QC210_221212	Interlab Duplicate	950091	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD341	12 Dec 2022	0089_SD341_221212	Normal	EP2216880	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	13 Mar 2023	0089_SD341_230313	Normal	EP2303087	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	07 Jun 2023	0089_SD341_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD341	05 Sep 2023	0089_SD341_230905	Normal	EP2312190	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD345	13 Apr 2018	0089_SD345_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
WWTP	SD345	09 Jan 2020	0089_SD345_0.30-0.40_200109	Normal	EP2000250	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD345	31 Mar 2020	0089_SD345_0.40-0.50_200331	Normal	EP2003371	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
WWTP	SD345	24 Sep 2020	0089_SD345_200924	Normal	EP2010272	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD345	15 Dec 2020	0089_SD345_201215	Normal	EP2014052	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD345	16 Mar 2021	0089_SD345_210316	Normal	EP2102835	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0017	0.0017	0.0017
WWTP	SD345	09 Jun 2021	0089_SD345_210609	Normal	EP2106518	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003

Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
WWTP	**SD345**	**01 Sep 2021**	**0089_SD345_210901**	**Normal**	**EP2110156**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD345**	**10 Jan 2022**	**0089_SD345_220110**	**Normal**	**EP2200217**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD345**	**14 Mar 2022**	**0089_SD345_220314**	**Normal**	**EP2202978**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD345**	**07 Jun 2022**	**0089_SD345_220607**	**Normal**	**EP2206885**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0007	0.0007	0.0007
WWTP	**SD345**	**05 Sep 2022**	**0089_SD345_220905**	**Normal**	**EP2211342**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0016	0.0016	0.0016
WWTP	**SD345**	**13 Dec 2022**	**0089_SD345_221212**	**Normal**	**EP2216931**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	**SD345**	**14 Mar 2023**	**0089_SD345_230314**	**Normal**	**EP2303176**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD345**	**07 Jun 2023**	**0089_SD345_230607**	**Normal**	**EP2307495**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	**SD345**	**05 Sep 2023**	**0089_SD345_230905**	**Normal**	**EP2312171**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
Accommodation Area	**SD346**	**17 Apr 2018**	**0089_SD346_180417**	**Normal**	**209522**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
Accommodation Area	**SD346**	**08 Jan 2020**	**0089_SD346_200109**	**Normal**	**EP2000187**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
Accommodation Area	**SD346**	**01 Apr 2020**	**0089_SD346_0.30-0.40_200401**	**Normal**	**EP2003415**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0009	0.0009	0.0009
Accommodation Area	**SD346**	**15 Jul 2020**	**0089_SD346_200715**	**Normal**	**EP2007387**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0012	0.0012	0.0012
Accommodation Area	**SD346**	**22 Sep 2020**	**0089_SD346_200922**	**Normal**	**EP2010144**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0116	0.0116	0.0116
Accommodation Area	**SD346**	**15 Dec 2020**	**0089_SD346_201215**	**Normal**	**EP2014043**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0096	0.0096	0.0096
Accommodation Area	**SD346**	**17 Mar 2021**	**0089_SD346_210317**	**Normal**	**EP2102902**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0008	0.0008	0.0008
Accommodation Area	**SD346**	**10 Jun 2021**	**0089_SD346_210610**	**Normal**	**EP2106581**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0028	0.0028	0.0028
Accommodation Area	**SD346**	**30 Aug 2021**	**0089_QC105_210830**	**Field Duplicate**	**EP2110018**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0022	0.0022	0.0022
Accommodation Area	**SD346**	**30 Aug 2021**	**0089_QC205_210830**	**Interlab Duplicate**	**820919**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Accommodation Area	**SD346**	**30 Aug 2021**	**0089_SD346_210830**	**Normal**	**EP2110018**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0024	0.0024	0.0024
Accommodation Area	**SD346**	**12 Jan 2022**	**0089_QC117_220112**	**Field Duplicate**	**EP2200290**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0070	0.0070	0.0070
Accommodation Area	**SD346**	**12 Jan 2022**	**0089_QC217_220112**	**Interlab Duplicate**	**855202**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Accommodation Area	**SD346**	**12 Jan 2022**	**0089_SD346_220112**	**Normal**	**EP2200290**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0032	0.0032	0.0032
Accommodation Area	**SD346**	**18 Mar 2022**	**0089_SD346_220318**	**Normal**	**EP2203196**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0177	0.0179	0.0179
Accommodation Area	**SD346**	**08 Jun 2022**	**0089_SD346_220608**	**Normal**	**EP2206972**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0019	0.0019	0.0019
Accommodation Area	**SD346**	**06 Sep 2022**	**0089_SD346_220906**	**Normal**	**EP2211393**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0025	0.0025	0.0025
Accommodation Area	**SD346**	**12 Dec 2022**	**0089_SD346_221212**	**Normal**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0099	0.0099	0.0099
Accommodation Area	**SD346**	**14 Mar 2023**	**0089_QC117_230314**	**Field Duplicate**	**EP2303180**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
Accommodation Area	**SD346**	**14 Mar 2023**	**0089_QC217_230314**	**Interlab Duplicate**	**972487**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Accommodation Area	**SD346**	**14 Mar 2023**	**0089_SD346_230314**	**Normal**	**EP2303180**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
Accommodation Area	**SD346**	**07 Jun 2023**	**0089_SD346_230607**	**Normal**	**EP2307501**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0009	0.0009	0.0009
Accommodation Area	**SD346**	**05 Sep 2023**	**0089_SD346_230905**	**Normal**	**EP2312180**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0013	0.0013	0.0013
WWTP	**SD350**	**19 Apr 2018**	**0089_SD350_180419**	**Normal**	**209623**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
WWTP	**SD350**	**30 Jan 2020**	**0089_SD350_200130**	**Normal**	**EP2001005**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	**SD350**	**02 Apr 2020**	**0089_SD350_200402**	**Normal**	**EP2003477**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD350**	**21 Jul 2020**	**0089_SD350_200721**	**Normal**	**EP2007603**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD350**	**23 Sep 2020**	**0089_SD350_200923**	**Normal**	**EP2010219**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	**SD350**	**16 Dec 2020**	**0089_SD350_201216**	**Normal**	**EP2014091**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	**SD350**	**17 Mar 2021**	**0089_SD350_210317**	**Normal**	**EP2102888**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
WWTP	**SD350**	**08 Jun 2021**	**0089_SD350_210608**	**Normal**	**EP2106466**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	**SD350**	**30 Aug 2021**	**0089_SD350_210830**	**Normal**	**EP2110018**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
WWTP	**SD350**	**11 Jan 2022**	**0089_SD350_220111**	**Normal**	**EP2200279**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD350**	**14 Mar 2022**	**0089_SD350_220314**	**Normal**	**EP2202979**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
WWTP	**SD350**	**07 Jun 2022**	**0089_SD350_220607**	**Normal**	**EP2206882**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
WWTP	**SD350**	**07 Sep 2022**	**0089_SD350_220907**	**Normal**	**EP2211497**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD350**	**12 Dec 2022**	**0089_SD350_221212**	**Normal**	**EP2216875**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
WWTP	**SD350**	**15 Mar 2023**	**0089_SD350_230315**	**Normal**	**EP2303228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD350**	**07 Jun 2023**	**0089_SD350_230607**	**Normal**	**EP2307495**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD350**	**05 Sep 2023**	**0089_SD350_230905**	**Normal**	**EP2312186**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**19 Apr 2018**	**0089_SD351_180419**	**Normal**	**209623**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
WWTP	**SD351**	**30 Jan 2020**	**0089_SD351_200130**	**Normal**	**EP2001005**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**02 Apr 2020**	**0089_SD351_0.80-0.90_200402**	**Normal**	**EP2003475**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**21 Jul 2020**	**0089_SD351_200721**	**Normal**	**EP2007603**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**23 Sep 2020**	**0089_SD351_200923**	**Normal**	**EP2010219**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**16 Dec 2020**	**0089_SD351_201216**	**Normal**	**EP2014091**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**17 Mar 2021**	**0089_SD351_210317**	**Normal**	**EP2102888**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**08 Jun 2021**	**0089_SD351_210608**	**Normal**	**EP2106466**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	**SD351**	**30 Aug 2021**	**0089_SD351_210830**	**Normal**	**EP2110018**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**11 Jan 2022**	**0089_SD351_220111**	**Normal**	**EP2200279**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**14 Mar 2022**	**0089_SD351_220314**	**Normal**	**EP2202979**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**07 Jun 2022**	**0089_SD351_220607**	**Normal**	**EP2206885**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**07 Sep 2022**	**0089_SD351_220907**	**Normal**	**EP2211499**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**12 Dec 2022**	**0089_SD351_221212**	**Normal**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**15 Mar 2023**	**0089_SD351_230315**	**Normal**	**EP2303228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**07 Jun 2023**	**0089_SD351_230607**	**Normal**	**EP2307495**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**05 Sep 2023**	**0089_SD351_230905**	**Normal**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**19 Apr 2018**	**0089_SD352_180419**	**Normal**	**209623**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
WWTP	**SD352**	**30 Jan 2020**	**0089_SD352_200130**	**Normal**	**EP2001005**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**21 Jul 2020**	**0089_SD352_200721**	**Normal**	**EP2007596**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**23 Sep 2020**	**0089_SD352_200923**	**Normal**	**EP2010219**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**16 Dec 2020**	**0089_SD352_201216**	**Normal**	**EP2014091**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**17 Mar 2021**	**0089_SD352_210317**	**Normal**	**EP2102888**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**08 Jun 2021**	**0089_SD352_210608**	**Normal**	**EP2106466**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**30 Aug 2021**	**0089_SD352_210830**	**Normal**	**EP2110018**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**11 Jan 2022**	**0089_SD352_220111**	**Normal**	**EP2200279**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**14 Mar 2022**	**0089_SD352_220314**	**Normal**	**EP2202979**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**07 Jun 2022**	**0089_SD352_220607**	**Normal**	**EP2206882**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**07 Sep 2022**	**0089_SD352_220907**	**Normal**	**EP2211499**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**12 Dec 2022**	**0089_SD352_221212**	**Normal**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**15 Mar 2023**	**0089_SD352_230315**	**Normal**	**EP2303228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**07 Jun 2023**	**0089_SD352_230607**	**Normal**	**EP2307495**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**05 Sep 2023**	**0089_SD352_230905**	**Normal**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**12 Apr 2018**	**0089_QC1SD_180412**	**Field Duplicate**	**209345**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
Demolition Grounds	**SD356**	**12 Apr 2018**	**0089_QC2SD_180412**	**Interlab Duplicate**	**594110**	<0.001	<0.005	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05
Demolition Grounds	**SD356**	**12 Apr 2018**	**0089_SD356_180412**	**Normal**	**209345**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
Demolition Grounds	**SD356**	**10 Jan 2020**	**0089_SD356_200110**	**Normal**	**EP2000253**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**30 Mar 2020**	**0089_SD356_200330_0.50-0.60_20033**	**Normal**	**EP2003310**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**20 Jul 2020**	**0089_SD356_200720**	**Normal**	**EP2007546**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**23 Sep 2020**	**0089_SD356_200923**	**Normal**	**EP2010221**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**14 Dec 2020**	**0089_SD356_201214**	**Normal**	**EP2013974**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
Demolition Grounds	**SD356**	**16 Mar 2021**	**0089_SD356_210316**	**Normal**	**EP2102838**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**08 Jun 2021**	**0089_SD356_210608**	**Normal**	**EP2106466**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**30 Aug 2021**	**0089_QC109_210830**	**Field Duplicate**	**EP2110018**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**30 Aug 2021**	**0089_QC209_210830**	**Interlab Duplicate**	**820919**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition Grounds	**SD356**	**30 Aug 2021**	**0089_SD356_210830**	**Normal**	**EP2110018**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**10 Jan 2022**	**0089_SD356_220110**	**Normal**	**EP2200219**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**15 Mar 2022**	**0089_QC112_220315**	**Field Duplicate**	**EP2203020**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**15 Mar 2022**	**0089_QC212_220315**	**Interlab Duplicate**	**872903**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition Grounds	**SD356**	**15 Mar 2022**	**0089_SD356_220315**	**Normal**	**EP2203020**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**08 Jun 2022**	**0089_SD356_220608**	**Normal**	**EP2206968**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**05 Sep 2022**	**0089_SD356_220905**	**Normal**	**EP2211348**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**12 Dec 2022**	**0089_SD356_221212**	**Normal**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**15 Mar 2023**	**0089_SD356_230315**	**Normal**	**EP2303228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**07 Jun 2023**	**0089_QC114_230607**	**Field Duplicate**	**EP2307499**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**07 Jun 2023**	**0089_QC214_230607**	**Interlab Duplicate**	**997465**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition Grounds	**SD356**	**07 Jun 2023**	**0089_SD356_230607**	**Normal**	**EP2307499**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD356**	**11 Sep 2023**	**0089_SD356_230911**	**Normal**	**EP2312526**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**12 Apr 2018**	**0089_SD357_180412**	**Normal**	**209345**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
Demolition Grounds	**SD357**	**10 Jan 2020**	**0089_SD357_200110**	**Normal**	**EP2000253**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**30 Mar 2020**	**0089_SD357_200330_0.40-0.60_20033**	**Normal**	**EP2003310**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**20 Jul 2020**	**0089_SD357_200720**	**Normal**	**EP2007546**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**23 Sep 2020**	**0089_SD357_200923**	**Normal**	**EP2010221**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**14 Dec 2020**	**0089_SD357_201214**	**Normal**	**EP2013974**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**16 Mar 2021**	**0089_SD357_210316**	**Normal**	**EP2102838**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**08 Jun 2021**	**0089_SD357_210608**	**Normal**	**EP2106466**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**30 Aug 2021**	**0089_SD357_210830**	**Normal**	**EP2110018**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**10 Jan 2022**	**0089_SD357_220110**	**Normal**	**EP2200219**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**15 Mar 2022**	**0089_SD357_220315**	**Normal**	**EP2203020**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**08 Jun 2022**	**0089_SD357_220608**	**Normal**	**EP2206968**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**05 Sep 2022**	**0089_QC107_220905**	**Field Duplicate**	**EP2211348**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**05 Sep 2022**	**0089_QC207_220905**	**Interlab Duplicate**	**920981**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition Grounds	**SD357**	**05 Sep 2022**	**0089_SD357_220905**	**Normal**	**EP2211348**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**12 Dec 2022**	**0089_SD357_221212**	**Normal**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**15 Mar 2023**	**0089_SD357_230315**	**Normal**	**EP2303228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**07 Jun 2023**	**0089_SD357_230607**	**Normal**	**EP2307499**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD357**	**11 Sep 2023**	**0089_SD357_230911**	**Normal**	**EP2312526**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**12 Apr 2018**	**0089_SD358_180412**	**Normal**	**209345**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
Demolition Grounds	**SD358**	**10 Jan 2020**	**0089_SD358_200110**	**Normal**	**EP2000253**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**30 Mar 2020**	**0089_SD358_200330_0.50-0.60_20033**	**Normal**	**EP2003310**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**20 Jul 2020**	**0089_SD358_200720**	**Normal**	**EP2007546**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**23 Sep 2020**	**0089_SD358_200923**	**Normal**	**EP2010219**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**14 Dec 2020**	**0089_SD358_0.30_201214**	**Normal**	**EP2013990**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**16 Mar 2021**	**0089_SD358_210316**	**Normal**	**EP2102838**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**08 Jun 2021**	**0089_QC108_210608**	**Field Duplicate**	**EP2106466**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**08 Jun 2021**	**0089_QC208_210608**	**Interlab Duplicate**	**802464**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition Grounds	**SD358**	**08 Jun 2021**	**0089_SD358_210608**	**Normal**	**EP2106466**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**30 Aug 2021**	**0089_SD358_210830**	**Normal**	**EP2110018**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**10 Jan 2022**	**0089_SD358_220110**	**Normal**	**EP2200219**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**15 Mar 2022**	**0089_SD358_220315**	**Normal**	**EP2203020**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**08 Jun 2022**	**0089_SD358_220608**	**Normal**	**EP2206968**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**05 Sep 2022**	**0089_SD358_220905**	**Normal**	**EP2211348**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**12 Dec 2022**	**0089_SD358_221212**	**Normal**	**EP2216874**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**15 Mar 2023**	**0089_SD358_230315**	**Normal**	**EP2303228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**07 Jun 2023**	**0089_SD358_230607**	**Normal**	**EP2307499**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Grounds	**SD358**	**11 Sep 2023**	**0089_SD358_230911**	**Normal**	**EP2312526**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**13 Apr 2018**	**0089_SD362_180413**	**Normal**	**209417**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
FTA	**SD362**	**08 Jan 2020**	**0089_SD362_200108**	**Normal**	**EP2000181**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**31 Mar 2020**	**0089_SD362_200331**	**Normal**	**EP2003365**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**15 Jul 2020**	**0089_QC102_200715**	**Field Duplicate**	**EP2007384**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**15 Jul 2020**	**0089_QC202_200215**	**Interlab Duplicate**	**732844**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	**SD362**	**15 Jul 2020**	**0089_SD362_200715**	**Normal**	**EP2007384**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**22 Sep 2020**	**0089_SD362_200922**	**Normal**	**EP2010152**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**14 Dec 2020**	**0089_SD362_201214**	**Normal**	**EP2013987**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**15 Mar 2021**	**0089_SD362_210315**	**Normal**	**EP2102757**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
FTA	**SD362**	**08 Jun 2021**	**0089_SD362_210608**	**Normal**	**EP2106449**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**30 Aug 2021**	**0089_SD362_210830**	**Normal**	**EP2110023**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**10 Jan 2022**	**0089_SD362_220110**	**Normal**	**EP2200213**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**14 Mar 2022**	**0089_SD362_220314**	**Normal**	**EP2202978**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**07 Jun 2022**	**0089_SD362_220607**	**Normal**	**EP2206882**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**05 Sep 2022**	**0089_SD362_220905**	**Normal**	**EP2211346**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**12 Dec 2022**	**0089_SD362_221212**	**Normal**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**13 Mar 2023**	**0089_SD362_230313**	**Normal**	**EP2303087**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
FTA	**SD362**	**07 Jun 2023**	**0089_SD362_230607**	**Normal**	**EP2307501**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**05 Sep 2023**	**0089_SD362_230905**	**Normal**	**EP2312190**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**13 Apr 2018**	**0089_SD363_180413**	**Normal**	**209417**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
FTA	**SD363**	**08 Jan 2020**	**0089_SD363_200108**	**Normal**	**EP2000181**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**31 Mar 2020**	**0089_SD363_200331**	**Normal**	**EP2003365**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**15 Jul 2020**	**0089_SD363_200715**	**Normal**	**EP2007384**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**22 Sep 2020**	**0089_SD363_200922**	**Normal**	**EP2010152**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**14 Dec 2020**	**0089_SD363_201214**	**Normal**	**EP2013987**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**15 Mar 2021**	**0089_SD363_210315**	**Normal**	**EP2102754**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**08 Jun 2021**	**0089_SD363_210608**	**Normal**	**EP2106449**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**30 Aug 2021**	**0089_SD363_210830**	**Normal**	**EP2110023**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**10 Jan 2022**	**0089_SD363_220110**	**Normal**	**EP2200213**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**14 Mar 2022**	**0089_SD363_220314**	**Normal**	**EP2202978**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**07 Jun 2022**	**0089_SD363_220607**	**Normal**	**EP2206882**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**05 Sep 2022**	**0089_QC112_220905**	**Field Duplicate**	**EP2211342**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
FTA	**SD363**	**05 Sep 2022**	**0089_QC212_220905**	**Interlab Duplicate**	**920981**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	**SD363**	**05 Sep 2022**	**0089_SD363_220905**	**Normal**	**EP2211346**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
FTA	**SD363**	**12 Dec 2022**	**0089_SD363_221212**	**Normal**	**EP2216880**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
FTA	SD363	13 Mar 2023	0089_QC112_230313	Field Duplicate	EP2303087	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
FTA	SD363	13 Mar 2023	0089_QC212_230313	Interlab Duplicate	972487	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD363	13 Mar 2023	0089_SD363_230313	Normal	EP2303087	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD363	07 Jun 2023	0089_SD363_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD363	05 Sep 2023	0089_SD363_230905	Normal	EP2312190	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	13 Apr 2018	0089_SD364_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
FTA	SD364	09 Jan 2020	0089_SD364_0.40-0.50_200109	Normal	EP2000250	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	30 Mar 2020	0089_QC106_200330	Field Duplicate	EP2003315	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	30 Mar 2020	0089_QC206_200330	Interlab Duplicate	711144	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD364	30 Mar 2020	0089_SD364_200330	Normal	EP2003315	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	15 Jul 2020	0089_SD364_200715	Normal	EP2007384	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	22 Sep 2020	0089_SD364_200922	Normal	EP2010152	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	14 Dec 2020	0089_SD364_201214	Normal	EP2013986	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	15 Mar 2021	0089_SD364_210315	Normal	EP2102757	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	08 Jun 2021	0089_SD364_210608	Normal	EP2106466	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	30 Aug 2021	0089_SD364_210830	Normal	EP2110022	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	10 Jan 2022	0089_SD364_220110	Normal	EP2200217	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	14 Mar 2022	0089_SD364_220314	Normal	EP2202978	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	07 Jun 2022	0089_SD364_220607	Normal	EP2206882	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	05 Sep 2022	0089_SD364_220905	Normal	EP2211346	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	12 Dec 2022	0089_QC102_221212	Field Duplicate	EP2216880	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
FTA	SD364	12 Dec 2022	0089_QC202_221212	Interlab Duplicate	950091	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD364	12 Dec 2022	0089_SD364_221212	Normal	EP2216880	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
FTA	SD364	13 Mar 2023	0089_SD364_230313	Normal	EP2303087	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	07 Jun 2023	0089_QC117_230607	Field Duplicate	EP2307501	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	07 Jun 2023	0089_QC217_230607	Interlab Duplicate	997465	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD364	07 Jun 2023	0089_SD364_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	05 Sep 2023	0089_QC113_230905	Field Duplicate	EP2312190	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	SD364	05 Sep 2023	0089_QC213_230905	Interlab Duplicate	1023399	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
FTA	SD364	05 Sep 2023	0089_SD364_230905	Normal	EP2312190	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD367	17 Apr 2018	0089_SD367_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
WWTP	SD367	08 Jan 2020	0089_SD367_200109	Normal	EP2000187	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD367	31 Mar 2020	0089_SD367_0.40-0.50_200331	Normal	EP2003371	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD367	15 Jul 2020	0089_SD367_200715	Normal	EP2007384	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD367	22 Sep 2020	0089_SD367_200922	Normal	EP2010144	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD367	15 Dec 2020	0089_SD367_201215	Normal	EP2014049	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0007	0.0007	0.0007
WWTP	SD367	15 Mar 2021	0089_SD367_210315	Normal	EP2102757	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD367	09 Jun 2021	0089_SD367_210609	Normal	EP2106518	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	SD367	01 Sep 2021	0089_SD367_210901	Normal	EP2110156	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD367	11 Jan 2022	0089_QC114_220111	Field Duplicate	EP2200242	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	SD367	11 Jan 2022	0089_QC214_220111	Interlab Duplicate	855202	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
WWTP	SD367	11 Jan 2022	0089_SD367_220111	Normal	EP2200242	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	SD367	14 Mar 2022	0089_QC110_220314	Field Duplicate	EP2202978	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
WWTP	SD367	14 Mar 2022	0089_QC210_220314	Interlab Duplicate	872911	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
WWTP	SD367	14 Mar 2022	0089_SD367_220314	Normal	EP2202978	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
WWTP	SD367	07 Jun 2022	0089_SD367_220607	Normal	EP2206885	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0008	0.0008	0.0008
WWTP	SD367	05 Sep 2022	0089_QC109_220905	Field Duplicate	EP2211342	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0011	0.0011	0.0011
WWTP	SD367	05 Sep 2022	0089_QC209_220905	Interlab Duplicate	920981	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
WWTP	SD367	05 Sep 2022	0089_SD367_220905	Normal	EP2211342	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0011	0.0011	0.0011
WWTP	SD367	13 Dec 2022	0089_SD367_221212	Normal	EP2216931	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	SD367	14 Mar 2023	0089_SD367_230314	Normal	EP2303176	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0007	0.0007	0.0007
WWTP	SD367	07 Jun 2023	0089_SD367_230607	Normal	EP2307495	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0008	0.0008	0.0008
WWTP	SD367	05 Sep 2023	0089_SD367_230905	Normal	EP2312171	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD368	17 Apr 2018	0089_SD368_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
WWTP	SD368	08 Jan 2020	0089_SD368_200109	Normal	EP2000187	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD368	01 Apr 2020	0089_SD368_0.30-0.40_200401	Normal	EP2003415	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD368	20 Jul 2020	0089_SD368_200720	Normal	EP2007546	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD368	22 Sep 2020	0089_SD368_200922	Normal	EP2010144	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	SD368	15 Dec 2020	0089_SD368_201215	Normal	EP2014049	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD368	15 Mar 2021	0089_QC101_210315	Field Duplicate	EP2102757	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD368	15 Mar 2021	0089_QC201_210315	Interlab Duplicate	781350	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
WWTP	SD368	15 Mar 2021	0089_SD368_210315	Normal	EP2102757	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD368	10 Jun 2021	0089_SD368_210610	Normal	EP2106581	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0010	0.0010	0.0010
WWTP	SD368	01 Sep 2021	0089_SD368_210901	Normal	EP2110157	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
WWTP	SD368	11 Jan 2022	0089_SD368_220111	Normal	EP2200242	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	SD368	18 Mar 2022	0089_SD368_220318	Normal	EP2203196	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD368	08 Jun 2022	0089_SD368_220608	Normal	EP2206972	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
WWTP	SD368	05 Sep 2022	0089_SD368_220905	Normal	EP2211346	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD368	12 Dec 2022	0089_QC117_221212	Field Duplicate	EP2216880	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0009	0.0009	0.0009
WWTP	SD368	12 Dec 2022	0089_QC217_221212	Interlab Duplicate	950091	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
WWTP	SD368	12 Dec 2022	0089_SD368_221212	Normal	EP2216880	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0009	0.0009	0.0009
WWTP	SD368	13 Mar 2023	0089_SD368_230313	Normal	EP2303087	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	SD368	07 Jun 2023	0089_SD368_230607	Normal	EP2307501	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	SD368	05 Sep 2023	0089_SD368_230905	Normal	EP2312180	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	SD369	17 Apr 2018	0089_SD369_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
WWTP	SD369	09 Jan 2020	0089_SD369_0.40-0.50_200109	Normal	EP2000249	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
WWTP	SD369	31 Mar 2020	0089_SD369_0.40-0.50_200331	Normal	EP2003371	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0025	0.0025
WWTP	SD369	15 Jul 2020	0089_SD369_200715	Normal	EP2007384	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD369	24 Sep 2020	0089_SD369_200924	Normal	EP2010272	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
WWTP	SD369	15 Dec 2020	0089_SD369_201215	Normal	EP2014052	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	SD369	16 Mar 2021	0089_SD369_210316	Normal	EP2102835	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD369	09 Jun 2021	0089_SD369_210609	Normal	EP2106518	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	SD369	01 Sep 2021	0089_SD369_210901	Normal	EP2110156	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD369	10 Jan 2022	0089_SD369_220110	Normal	EP2200217	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD369	14 Mar 2022	0089_QC109_220314	Field Duplicate	EP2202978	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
WWTP	SD369	14 Mar 2022	0089_QC209_220314	Interlab Duplicate	872911	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
WWTP	SD369	14 Mar 2022	0089_SD369_220314	Normal	EP2202978	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
WWTP	SD369	07 Jun 2022	0089_QC106_220607	Field Duplicate	EP2206885	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0019	0.0019	0.0019
WWTP	SD369	07 Jun 2022	0089_QC206_220607	Interlab Duplicate	896805	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
WWTP	SD369	07 Jun 2022	0089_SD369_220607	Normal	EP2206885	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0021	0.0021	0.0021

Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
WWTP	**SD369**	**05 Sep 2022**	**0089_SD369_220905**	**Normal**	**EP2211342**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0020	0.0020	0.0020
WWTP	**SD369**	**13 Dec 2022**	**0089_SD369_221212**	**Normal**	**EP2216931**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD369**	**14 Mar 2023**	**0089_SD369_230314**	**Normal**	**EP2303176**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	**SD369**	**07 Jun 2023**	**0089_QC113_230607**	**Field Duplicate**	**EP2307495**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD369**	**07 Jun 2023**	**0089_QC213_230607**	**Interlab Duplicate**	**997465**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
WWTP	**SD369**	**07 Jun 2023**	**0089_SD369_230607**	**Normal**	**EP2307495**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD369**	**05 Sep 2023**	**0089_SD369_230905**	**Normal**	**EP2312171**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD374**	**18 Apr 2018**	**0089_SD374_180418**	**Normal**	**209573**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
Dredge spoil and Careening Bay	**SD374**	**08 Jan 2020**	**0089_QC107_200109**	**Field Duplicate**	**EP2000187**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD374**	**08 Jan 2020**	**0089_QC207_200108**	**Interlab Duplicate**	**696100**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Dredge spoil and Careening Bay	**SD374**	**08 Jan 2020**	**0089_SD374_200109**	**Normal**	**EP2000187**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD374**	**30 Mar 2020**	**0089_SD374_0.40-0.50_200330**	**Normal**	**EP2003314**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil and Careening Bay	**SD374**	**21 Jul 2020**	**0089_SD374_200721**	**Normal**	**EP2007603**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD374**	**21 Sep 2020**	**0089_QC102_200921**	**Field Duplicate**	**EP2010075**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil and Careening Bay	**SD374**	**21 Sep 2020**	**0089_QC202_200921**	**Interlab Duplicate**	**746269**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Dredge spoil and Careening Bay	**SD374**	**21 Sep 2020**	**0089_SD374_200921**	**Normal**	**EP2010075**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
Dredge spoil and Careening Bay	**SD374**	**14 Dec 2020**	**0089_SD374_201214**	**Normal**	**EP2013990**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD374**	**15 Mar 2021**	**0089_QC105_210315**	**Field Duplicate**	**EP2102757**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD374**	**15 Mar 2021**	**0089_QC205_210315**	**Interlab Duplicate**	**781350**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Dredge spoil and Careening Bay	**SD374**	**15 Mar 2021**	**0089_SD374_210315**	**Normal**	**EP2102757**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD374**	**10 Jun 2021**	**0089_SD374_210610**	**Normal**	**EP2106581**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
Dredge spoil and Careening Bay	**SD374**	**01 Sep 2021**	**0089_SD374_210901**	**Normal**	**EP2110156**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD374**	**13 Jan 2022**	**0089_SD374_220113**	**Normal**	**EP2200341**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD374**	**16 Mar 2022**	**0089_SD374_220316**	**Normal**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD374**	**09 Jun 2022**	**0089_SD374_220609**	**Normal**	**EP2207027**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil and Careening Bay	**SD374**	**06 Sep 2022**	**0089_SD374_220906**	**Normal**	**EP2211393**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
Dredge spoil and Careening Bay	**SD374**	**13 Dec 2022**	**0089_SD374_221212**	**Normal**	**EP2216935**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD374**	**14 Mar 2023**	**0089_SD374_230314**	**Normal**	**EP2303180**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD374**	**06 Jun 2023**	**0089_QC107_230606**	**Field Duplicate**	**EP2307435**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
Dredge spoil and Careening Bay	**SD374**	**06 Jun 2023**	**0089_QC207_230606**	**Interlab Duplicate**	**997465**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Dredge spoil and Careening Bay	**SD374**	**06 Jun 2023**	**0089_SD374_230606**	**Normal**	**EP2307435**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil and Careening Bay	**SD374**	**04 Sep 2023**	**0089_SD374_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD375**	**18 Apr 2018**	**0089_SD375_180418**	**Normal**	**209573**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
Dredge spoil and Careening Bay	**SD375**	**08 Jan 2020**	**0089_SD375_200109**	**Normal**	**EP2000187**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
Dredge spoil and Careening Bay	**SD375**	**30 Mar 2020**	**0089_SD375_0.30-0.40_200330**	**Normal**	**EP2003314**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
Dredge spoil and Careening Bay	**SD375**	**21 Jul 2020**	**0089_SD375_200721**	**Normal**	**EP2007603**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD375**	**21 Sep 2020**	**0089_SD375_200921**	**Normal**	**EP2010075**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil and Careening Bay	**SD375**	**14 Dec 2020**	**0089_SD375_0.30_201214**	**Normal**	**EP2013990**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD375**	**15 Mar 2021**	**0089_SD375_210315**	**Normal**	**EP2102757**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
Dredge spoil and Careening Bay	**SD375**	**10 Jun 2021**	**0089_SD375_210610**	**Normal**	**EP2106581**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
Dredge spoil and Careening Bay	**SD375**	**01 Sep 2021**	**0089_SD375_210901**	**Normal**	**EP2110156**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
Dredge spoil and Careening Bay	**SD375**	**13 Jan 2022**	**0089_SD375_220113**	**Normal**	**EP2200341**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
Dredge spoil and Careening Bay	**SD375**	**16 Mar 2022**	**0089_SD375_220316**	**Normal**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD375**	**09 Jun 2022**	**0089_SD375_220609**	**Normal**	**EP2207027**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil and Careening Bay	**SD375**	**06 Sep 2022**	**0089_SD375_220906**	**Normal**	**EP2211393**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil and Careening Bay	**SD375**	**13 Dec 2022**	**0089_SD375_221212**	**Normal**	**EP2216935**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD375**	**14 Mar 2023**	**0089_SD375_230314**	**Normal**	**EP2303180**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD375**	**06 Jun 2023**	**0089_SD375_230606**	**Normal**	**EP2307435**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0030	0.0030	0.0030
Dredge spoil and Careening Bay	**SD375**	**04 Sep 2023**	**0089_SD375_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD378**	**17 Apr 2018**	**0089_SD378_180417**	**Normal**	**209522**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
Dredge spoil and Careening Bay	**SD378**	**08 Jan 2020**	**0089_SD378_200109**	**Normal**	**EP2000187**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil and Careening Bay	**SD378**	**30 Mar 2020**	**0089_SD378_0.30-0.40_200330**	**Normal**	**EP2003314**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
Dredge spoil and Careening Bay	**SD378**	**21 Jul 2020**	**0089_SD378_200721**	**Normal**	**EP2007603**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD378**	**21 Sep 2020**	**0089_QC105_200921**	**Field Duplicate**	**EP2010075**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD378**	**21 Sep 2020**	**0089_QC205_200921**	**Interlab Duplicate**	**746269**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Dredge spoil and Careening Bay	**SD378**	**21 Sep 2020**	**0089_SD378_200921**	**Normal**	**EP2010075**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD378**	**14 Dec 2020**	**0089_SD378_201214**	**Normal**	**EP2013990**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD378**	**15 Mar 2021**	**0089_SD378_210315**	**Normal**	**EP2102757**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD378**	**10 Jun 2021**	**0089_QC117_210610**	**Field Duplicate**	**EP2106581**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil and Careening Bay	**SD378**	**10 Jun 2021**	**0089_QC217_210610**	**Interlab Duplicate**	**802734**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Dredge spoil and Careening Bay	**SD378**	**10 Jun 2021**	**0089_SD378_210610**	**Normal**	**EP2106581**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
Dredge spoil and Careening Bay	**SD378**	**01 Sep 2021**	**0089_SD378_210901**	**Normal**	**EP2110156**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
Dredge spoil and Careening Bay	**SD378**	**13 Jan 2022**	**0089_SD378_220113**	**Normal**	**EP2200341**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD378**	**16 Mar 2022**	**0089_SD378_220316**	**Normal**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD378**	**09 Jun 2022**	**0089_SD378_220609**	**Normal**	**EP2207027**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil and Careening Bay	**SD378**	**06 Sep 2022**	**0089_SD378_220906**	**Normal**	**EP2211393**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
Dredge spoil and Careening Bay	**SD378**	**13 Dec 2022**	**0089_SD378_221212**	**Normal**	**EP2216935**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD378**	**14 Mar 2023**	**0089_SD378_230314**	**Normal**	**EP2303180**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD378**	**06 Jun 2023**	**0089_SD378_230606**	**Normal**	**EP2307435**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
Dredge spoil and Careening Bay	**SD378**	**04 Sep 2023**	**0089_QC103_230904**	**Field Duplicate**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and Careening Bay	**SD378**	**04 Sep 2023**	**0089_QC203_230904**	**Interlab Duplicate**	**1023399**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Dredge spoil and Careening Bay	**SD378**	**04 Sep 2023**	**0089_SD378_230904**	**Normal**	**EP2312228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**19 Apr 2018**	**0089_SD380_180419**	**Normal**	**209623**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
WWTP	**SD380**	**30 Jan 2020**	**0089_SD380_200130**	**Normal**	**EP2001005**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**02 Apr 2020**	**0089_-SD380_0.80-0.90_200402**	**Normal**	**EP2003475**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**21 Jul 2020**	**0089_SD380_200721**	**Normal**	**EP2007603**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**23 Sep 2020**	**0089_SD380_200923**	**Normal**	**EP2010219**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
WWTP	**SD380**	**16 Dec 2020**	**0089_SD380_201216**	**Normal**	**EP2014091**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**17 Mar 2021**	**0089_SD380_210317**	**Normal**	**EP2102888**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**08 Jun 2021**	**0089_SD380_210608**	**Normal**	**EP2106466**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	**SD380**	**30 Aug 2021**	**0089_SD380_210830**	**Normal**	**EP2110018**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**11 Jan 2022**	**0089_SD380_220111**	**Normal**	**EP2200279**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**14 Mar 2022**	**0089_SD380_220314**	**Normal**	**EP2202979**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**07 Jun 2022**	**0089_SD380_220607**	**Normal**	**EP2206885**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**07 Sep 2022**	**0089_SD380_220907**	**Normal**	**EP2211499**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**12 Dec 2022**	**0089_SD380_221212**	**Normal**	**EP2216875**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
WWTP	**SD380**	**15 Mar 2023**	**0089_SD380_230315**	**Normal**	**EP2303228**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**07 Jun 2023**	**0089_SD380_230607**	**Normal**	**EP2307495**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**05 Sep 2023**	**0089_SD380_230905**	**Normal**	**EP2312186**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD381**	**19 Apr 2018**	**0089_SD381_180419**	**Normal**	**209623**	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			

Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
WWTP	SD381	30 Jan 2020	0089_SD381_200130	Normal	EP2001005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	02 Apr 2020	0089_SD381_0.80-0.90_200402	Normal	EP2003475	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	21 Jul 2020	0089_SD381_200721	Normal	EP2007596	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	23 Sep 2020	0089_SD381_200923	Normal	EP2010219	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	16 Dec 2020	0089_SD381_201216	Normal	EP2014091	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	17 Mar 2021	0089_SD381_210317	Normal	EP2102888	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	08 Jun 2021	0089_SD381_210608	Normal	EP2106466	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	30 Aug 2021	0089_SD381_210830	Normal	EP2110018	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	11 Jan 2022	0089_SD381_220111	Normal	EP2200279	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	14 Mar 2022	0089_SD381_220314	Normal	EP2202979	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	07 Jun 2022	0089_SD381_220607	Normal	EP2206885	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	07 Sep 2022	0089_SD381_220907	Normal	EP2211499	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	12 Dec 2022	0089_SD381_221212	Normal	EP2216875	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	15 Mar 2023	0089_SD381_230315	Normal	EP2303228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	07 Jun 2023	0089_SD381_230607	Normal	EP2307495	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD381	05 Sep 2023	0089_SD381_230905	Normal	EP2312190	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD401	19 Apr 2018	0089_SD379_180419	Normal	209623	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
WWTP	SD401	30 Jan 2020	0089_SD401_200130	Normal	EP2001005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	SD401	02 Apr 2020	0089_SD401_0.80-0.90_200402	Normal	EP2003475	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD401	21 Jul 2020	0089_SD401_200721	Normal	EP2007603	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD401	23 Sep 2020	0089_SD401_200923	Normal	EP2010219	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	SD401	16 Dec 2020	0089_SD401_201216	Normal	EP2014091	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	SD401	17 Mar 2021	0089_SD401_210317	Normal	EP2102888	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	SD401	08 Jun 2021	0089_SD401_210608	Normal	EP2106466	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	SD401	30 Aug 2021	0089_SD401_210830	Normal	EP2110018	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD401	11 Jan 2022	0089_SD401_220111	Normal	EP2200279	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
WWTP	SD401	14 Mar 2022	0089_SD401_220314	Normal	EP2202979	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD401	07 Jun 2022	0089_SD401_220607	Normal	EP2206885	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	SD401	07 Sep 2022	0089_SD401_220907	Normal	EP2211499	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD401	12 Dec 2022	0089_SD401_221212	Normal	EP2216875	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0015	0.0015	0.0015
WWTP	SD401	15 Mar 2023	0089_SD401_230315	Normal	EP2303228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD401	07 Jun 2023	0089_SD401_230607	Normal	EP2307495	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	SD401	05 Sep 2023	0089_SD401_230905	Normal	EP2312190	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	14 Jan 2020	0089_SD405_200114	Normal	EP2000423	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
HSF	SD405	01 Apr 2020	0089_SD405_200401	Normal	EP2003419	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	22 Jul 2020	0089_SD405_200722	Normal	EP2007650	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	21 Sep 2020	0089_SD405_200921	Normal	EP2010075	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	15 Dec 2020	0089_SD405_201215	Normal	EP2014049	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	15 Mar 2021	0089_SD405_210315	Normal	EP2102754	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	10 Jun 2021	0089_QC116_210610	Field Duplicate	EP2106589	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
HSF	SD405	10 Jun 2021	0089_QC216_210610	Interlab Duplicate	802734	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
HSF	SD405	10 Jun 2021	0089_SD405_210610	Normal	EP2106589	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
HSF	SD405	31 Aug 2021	0089_SD405_210831	Normal	EP2110067	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	14 Jan 2022	0089_SD405_220114	Normal	EP2200401	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	16 Mar 2022	0089_SD405_220316	Normal	EP2203059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	07 Jun 2022	0089_SD405_220607	Normal	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	07 Sep 2022	0089_SD405_220907	Normal	EP2211497	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	13 Dec 2022	0089_SD405_221212	Normal	EP2216935	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	14 Mar 2023	0089_SD405_230314	Normal	EP2303180	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	08 Jun 2023	0089_SD405_230608	Normal	EP2307591	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD405	05 Sep 2023	0089_SD405_230905	Normal	EP2312186	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	14 Jan 2020	0089_SD407_200114	Normal	EP2000423	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	01 Apr 2020	0089_SD407_200401	Normal	EP2003419	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	02 Apr 2020	0089_SD407_200402	Normal	EP2003477	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	22 Jul 2020	0089_SD407_200722	Normal	EP2007650	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	21 Sep 2020	0089_SD407_200921	Normal	EP2010075	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	15 Dec 2020	0089_SD407_201215	Normal	EP2014052	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	15 Mar 2021	0089_SD407_210315	Normal	EP2102754	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	10 Jun 2021	0089_SD407_210610	Normal	EP2106589	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	31 Aug 2021	0089_SD407_210831	Normal	EP2110067	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	14 Jan 2022	0089_SD407_220114	Normal	EP2200401	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	16 Mar 2022	0089_SD407_220316	Normal	EP2203059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	07 Jun 2022	0089_QC114_220607	Field Duplicate	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	07 Jun 2022	0089_QC214_220607	Interlab Duplicate	896805	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
HSF	SD407	07 Jun 2022	0089_SD407_220607	Normal	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	07 Sep 2022	0089_SD407_220907	Normal	EP2211499	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	13 Dec 2022	0089_SD407_221212	Normal	EP2216931	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	14 Mar 2023	0089_SD407_230314	Normal	EP2303180	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	08 Jun 2023	0089_SD407_230608	Normal	EP2307591	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD407	05 Sep 2023	0089_SD407_230905	Normal	EP2312186	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	14 Jan 2020	0089_SD409_200114	Normal	EP2000423	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	01 Apr 2020	0089_SD409_200401	Normal	EP2003419	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	21 Jul 2020	0089_SD409_200721	Normal	EP2007603	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	22 Sep 2020	0089_SD409_200922	Normal	EP2010144	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	15 Dec 2020	0089_SD409_201215	Normal	EP2014043	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	17 Mar 2021	0089_SD409_210317	Normal	EP2102902	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	10 Jun 2021	0089_SD409_210610	Normal	EP2106589	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0011	0.0011	0.0011
HSF	SD409	31 Aug 2021	0089_SD409_210831	Normal	EP2110067	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	14 Jan 2022	0089_SD409_220114	Normal	EP2200401	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	16 Mar 2022	0089_SD409_220316	Normal	EP2203059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	07 Jun 2022	0089_SD409_220607	Normal	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	06 Sep 2022	0089_SD409_220906	Normal	EP2211393	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	13 Dec 2022	0089_SD409_221212	Normal	EP2216935	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	14 Mar 2023	0089_SD409_230314	Normal	EP2303180	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	08 Jun 2023	0089_SD409_230608	Normal	EP2307591	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	04 Sep 2023	0089_QC108_230904	Field Duplicate	EP2312228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD409	04 Sep 2023	0089_QC208_230904	Interlab Duplicate	1023399	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
HSF	SD409	04 Sep 2023	0089_SD409_230904	Normal	EP2312228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	14 Jan 2020	0089_SD411_200114	Normal	EP2000423	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	0.0004
HSF	SD411	01 Apr 2020	0089_SD411_1.00-1.10_200401	Normal	EP2003416	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
HSF	SD411	21 Jul 2020	0089_SD411_200721	Normal	EP2007603	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	22 Sep 2020	0089_SD411_200922	Normal	EP2010144	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	15 Dec 2020	0089_SD411_201215	Normal	EP2014043	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	18 Mar 2021	0089_SD411_210318	Normal	EP2102942	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	09 Jun 2021	0089_SD411_210609	Normal	EP2106520	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	01 Sep 2021	0089_SD411_210901	Normal	EP2110156	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	14 Jan 2022	0089_SD411_220114	Normal	EP2200401	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	16 Mar 2022	0089_SD411_220316	Normal	EP2203059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	07 Jun 2022	0089_SD411_220607	Normal	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	06 Sep 2022	0089_SD411_220906	Normal	EP2211402	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	14 Dec 2022	0089_SD411_221214	Normal	EP2216974	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	15 Mar 2023	0089_SD411_230315	Normal	EP2303228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	08 Jun 2023	0089_SD411_230608	Normal	EP2307594	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	04 Sep 2023	0089_QC111_230904	Field Duplicate	EP2312228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD411	04 Sep 2023	0089_QC211_230904	Interlab Duplicate	1023399	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
HSF	SD411	04 Sep 2023	0089_SD411_230904	Normal	EP2312228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	14 Jan 2020	0089_SD413_200114	Normal	EP2000423	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	01 Apr 2020	0089_SD413_0.60-0.70_200401	Normal	EP2003416	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	21 Jul 2020	0089_SD413_200721	Normal	EP2007603	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	22 Sep 2020	0089_SD413_200922	Normal	EP2010144	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	15 Dec 2020	0089_SD413_201215	Normal	EP2014043	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	18 Mar 2021	0089_SD413_210318	Normal	EP2102942	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	09 Jun 2021	0089_SD413_210609	Normal	EP2106520	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	01 Sep 2021	0089_SD413_210901	Normal	EP2110157	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	14 Jan 2022	0089_SD413_220114	Normal	EP2200401	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	16 Mar 2022	0089_SD413_220316	Normal	EP2203059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	07 Jun 2022	0089_SD413_220607	Normal	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	06 Sep 2022	0089_SD413_220906	Normal	EP2211402	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	14 Dec 2022	0089_SD413_221214	Normal	EP2216974	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	15 Mar 2023	0089_SD413_230315	Normal	EP2303228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	08 Jun 2023	0089_SD413_230608	Normal	EP2307594	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD413	04 Sep 2023	0089_SD413_230904	Normal	EP2312228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	14 Jan 2020	0089_SD415_200114	Normal	EP2000423	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	01 Apr 2020	0089_SD415_0.50-0.60_200401	Normal	EP2003416	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	21 Jul 2020	0089_SD415_200721	Normal	EP2007603	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	22 Sep 2020	0089_SD415_200922	Normal	EP2010144	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	15 Dec 2020	0089_SD415_201215	Normal	EP2014043	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	18 Mar 2021	0089_SD415_210318	Normal	EP2102942	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	09 Jun 2021	0089_SD415_210609	Normal	EP2106520	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	01 Sep 2021	0089_SD415_210901	Normal	EP2110157	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	14 Jan 2022	0089_SD415_220114	Normal	EP2200401	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	16 Mar 2022	0089_SD415_220316	Normal	EP2203059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	07 Jun 2022	0089_SD415_220607	Normal	EP2206886	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	06 Sep 2022	0089_SD415_220906	Normal	EP2211402	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	14 Dec 2022	0089_SD415_221214	Normal	EP2216974	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	15 Mar 2023	0089_SD415_230315	Normal	EP2303228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	08 Jun 2023	0089_SD415_230608	Normal	EP2307594	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	SD415	04 Sep 2023	0089_SD415_230904	Normal	EP2312228	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Notes:

First Time detection of PFOA or PFHxS+PFOS

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW109	**03 Aug 2017**	2.01	20.5	96	673	7.51
MW109	**16 Dec 2019**	1.92	26.1		801	7.04
MW109	**30 Mar 2020**	1.55	21.8		918	7.34
MW109	**15 Jul 2020**	2.77	19.1	23.9	923	7.28
MW109	**21 Sep 2020**	2.18	19.2	-58	1,434	7.97
MW109	**14 Dec 2020**	0.73	22.3	-79.3	1,620	7.4
MW109	**16 Mar 2021**	0.32	22.4	-223.7	1,173	7.44
MW109	**08 Jun 2021**	3.03	20		497.6	7.52
MW109	**30 Aug 2021**	2.41	20.1	37.5	842	7.36
MW109	**16 Nov 2021**	2.41	20.1	37.5	842	7.36
MW109	**14 Mar 2022**	1.32	25	143.2	1,510	7.67
MW109	**07 Jun 2022**	1.31	18	-172.2	936	7.42
MW109	**05 Sep 2022**	1.46	19.8	66.7	880	7.34
MW109	**12 Dec 2022**	2.25	20.8	17.2	813	7.47
MW109	**13 Mar 2023**	2.63	21.9	99.8	1,192	7.15
MW109	**14 Jul 2023**	0.7	19.4	94.5	804	7.21
MW109	**05 Sep 2023**	2.57	20.4	2.9	817	7.33
MW112	**03 Aug 2017**	4.45	21.2	78	441	7.56
MW112	**08 Jan 2020**	4.06	23.6		651	7.7
MW112	**30 Mar 2020**	2.24	23.6		540	7.48
MW112	**15 Jul 2020**	3.1	19.8	75.1	505	7.56
MW112	**21 Sep 2020**	3.48	20.5	-7.8	699	7.73
MW112	**14 Dec 2020**	1.76	21.9	-71.6	653	7.52
MW112	**16 Mar 2021**	1.65	23.2	116.7	534	7.63
MW112	**08 Jun 2021**	2.29	20		548.8	7.71
MW112	**30 Aug 2021**	2.39	19.7	80.2	523.7	7.51
MW112	**10 Jan 2022**	1.23	21.2	134.7	562	7.55
MW112	**14 Mar 2022**	3.4	22.5	70	579	7.78
MW112	**07 Jun 2022**	1.23	19.8	119.2	485.5	7.64
MW112	**05 Sep 2022**	1.63	19.6	59.2	515.5	7.67
MW112	**12 Dec 2022**	1.04	22.4	-18.6	533	7.64
MW112	**13 Mar 2023**	1.45	22.2	-76.2	583	7.42
MW112	**14 Jul 2023**	0.1	20.5	49.6	589	7.43
MW112	**05 Sep 2023**	1.13	21.3	-6.2	526	7.56
MW120	**03 Aug 2017**	0.71	20.3	-12	599	7.56
MW120	**04 Nov 2019**	2.31	21.4		595	7.45
MW120	**16 Dec 2019**	3.78	22.4		700	7.5
MW120	**30 Mar 2020**	2.58	23		608	7.52
MW120	**15 Jul 2020**	2.04	19.1	60.8	464.1	7.54
MW120	**14 Dec 2020**	0.9	20.8	-49.9	589	7.58
MW120	**16 Mar 2021**	2.06	23.2	82.2	635	7.64
MW120	**08 Jun 2021**	1.08	19.6		633	7.7
MW120	**30 Aug 2021**	2.26	19.7	74.6	639	7.5
MW120	**16 Nov 2021**	2.26	19.7	74.6	639	7.5
MW120	**10 Jan 2022**	1.9	21	140.4	644	7.58
MW120	**14 Mar 2022**	1.64	24.1	137	697	7.82
MW120	**07 Jun 2022**	1.29	19.7	110.1	632	7.52
MW120	**05 Sep 2022**	3.42	19.1	60.1	670	7.7
MW120	**12 Dec 2022**	1.63	21.4	-13.5	916	7.86
MW120	**13 Mar 2023**	1.77	22.2	123.1	704	7.5
MW120	**05 Sep 2023**	1.44	20	-0.9	657	7.6
MW121	**03 Aug 2017**	7.01	20.4	102	498	7.64
MW121	**05 Nov 2019**	7.49	21.4		486.7	7.75
MW121	**16 Dec 2019**	5.74	25.6		592	7.27
MW121	**30 Mar 2020**	1.8	22.6		590	7.57
MW121	**15 Jul 2020**	13.28	19.5	57.2	521	7.36
MW121	**21 Sep 2020**	5.38	21.4	54.6	751	7.55
MW121	**14 Dec 2020**	3.76	20	-12.4	661	7.76
MW121	**16 Mar 2021**	1.41	26	33.3	695	7.3
MW121	**08 Jun 2021**	4.7	18.5		806	7.68
MW121	**30 Aug 2021**	5.72	20.3	87.4	733	7.72
MW121	**15 Nov 2021**	5.71	22.5	8.1	663	8.45
MW121	**10 Jan 2022**	5.16	20.8	135.7	505.5	7.87
MW121	**14 Mar 2022**	5.05	25.6	147.6	686	7.78
MW121	**07 Jun 2022**	5.15	19	68.3	763	7.72
MW121	**05 Sep 2022**	7.39	19	37.8	550.2	7.99
MW121	**12 Dec 2022**	5.68	21.6	7.7	544	8
MW121	**13 Mar 2023**	5.15	22.6	109.3	599	7.77
MW121	**05 Sep 2023**	5.84	20.2	2.6	604	7.91
MW123	**03 Aug 2017**	4.64	19.5	95	492	7.49
MW123	**16 Dec 2019**	5.47	22.1		677	7.22
MW123	**14 Dec 2020**	2.21	20.3	-125.8	1,655	7.84
MW123	**16 Mar 2021**	3.89	24.2	61.8	661	7.69
MW123	**08 Jun 2021**	1.84	18.6		820	7.42
MW123	**30 Aug 2021**	1.74	19.6	-190.2	770	7.38
MW123	**15 Nov 2021**	1.16	21.7	-125.9	893	7.22
MW123	**16 Nov 2021**	1.74	19.6	-190.2	770	7.38
MW123	**10 Jan 2022**	1.27	20.9	171.7	858	7.34
MW123	**14 Mar 2022**	2.18	20.4	45.3	1,657	7.38
MW123	**07 Jun 2022**	0.44	17.7	-133.5	1,971	7.4
MW123	**05 Sep 2022**	0.52	19.5	-20.9	1,460	7.59
MW123	**12 Dec 2022**	1.87	22.3	-32.6	2,339	7.8
MW123	**13 Mar 2023**	1.96	21.4	118.5	2,474	7.4
MW123	**05 Sep 2023**	1.66	19.6	-29.7	1,393	7.54
MW124	**03 Aug 2017**	0.04	17.8	-289	27,400	7.17
MW124	**30 Mar 2020**	4.29	21		39,913	7.14
MW124	**15 Jul 2020**	6.09	15.6	7.05	40,089	7.04
MW124	**22 Sep 2020**	2.19	19.3	-82.3	47,467	7.36
MW124	**14 Dec 2020**	0.51	19.5	-188.3	40,107	7.16
MW124	**15 Mar 2021**	0.83	20.8	-262.9	38,532	7.99
MW124	**08 Jun 2021**	0.97	19		42,836	7.31
MW124	**30 Aug 2021**	1.27	17	-226.3	42,307	7.26
MW124	**16 Nov 2021**	1.27	17	-226.3	42,307	7.26
MW124	**10 Jan 2022**	0.4	19.9	-303.8	35,739	7.5
MW124	**14 Mar 2022**	0.53	21.4	-247.3	39,644	7.11
MW124	**07 Jun 2022**	0.69	18.4	-186.7	20,665	7.33

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW124	**05 Sep 2022**	0.56	16.7	-314	37,916	7.12
MW124	**12 Dec 2022**	0.3	20.5	-317.3	38,051	6.68
MW124	**13 Mar 2023**	0.58	21.6	-316.9	43,647	6.72
MW124	**07 Jun 2023**	1.55	18.7	-179.8	39,032	7.33
MW124	**05 Sep 2023**	1.25	18	-105.9	32,781	7.15
MW125	**03 Aug 2017**	0.08	17.9	-309	27,800	7.19
MW125	**30 Mar 2020**	2.5	20.7		42,625	7.02
MW125	**15 Jul 2020**	4.35	16.4	-171.3	40,575	7.09
MW125	**22 Sep 2020**	1.82	19.2	-154.5	48,861	7.16
MW125	**14 Dec 2020**	0.29	19.6	-187.9	40,970	7.14
MW125	**15 Mar 2021**	0.81	21.1	-199.4	44,213	7.4
MW125	**08 Jun 2021**	1.02	19		45,553	7.29
MW125	**30 Aug 2021**	0.5	17.6	-205.3	29,455	7.18
MW125	**16 Nov 2021**	0.5	17.6	-205.3	29,455	7.18
MW125	**10 Jan 2022**	0.38	20.7	-266.6	36,979	7.25
MW125	**14 Mar 2022**	0.65	23.6	-305.3	45,470	7.17
MW125	**07 Jun 2022**	0.77	18.9	-245.8	44,803	7.27
MW125	**05 Sep 2022**	0.21	19	-347.7	41,218	7.16
MW125	**12 Dec 2022**	0.77	21.6	-302.7	43,543	7.15
MW125	**13 Mar 2023**	0.16	22.2	-290.9	39,002	6.56
MW125	**07 Jun 2023**	1.28	19.4	-234.9	41,227	7.23
MW125	**05 Sep 2023**	0.66	20.4	-275.7	35,806	7.13
MW126	**03 Aug 2017**	0.01	17.9	-313	26,300	7.02
MW126	**08 Jan 2020**	4.67	21.1		41,841	7.09
MW126	**31 Mar 2020**	1.8	19.5		38,371	7.04
MW126	**15 Jul 2020**	2.96	16.7	-234.8	40,030	6.91
MW126	**22 Sep 2020**	0.91	19.3	-162.3	46,315	7.17
MW126	**14 Dec 2020**	0.64	19.7	-217.1	37,968	7.03
MW126	**15 Mar 2021**	1.24	20.3	-254.2	40,561	7.24
MW126	**08 Jun 2021**	1.29	19.7		43,757	7.33
MW126	**30 Aug 2021**	1.24	18.8	-217.3	43,803	6.94
MW126	**16 Nov 2021**	1.24	18.8	-217.3	43,803	6.94
MW126	**10 Jan 2022**	0.91	20.5	-297.2	43,258	6.95
MW126	**14 Mar 2022**	0.27	23.5	-320.3	41,517	7.03
MW126	**07 Jun 2022**	1.11	18.8	-250	41,941	7.09
MW126	**05 Sep 2022**	0.61	20.8	-344.4	41,207	6.95
MW126	**12 Dec 2022**	0.42	21.6	-324.1	39,481	6.99
MW126	**13 Mar 2023**	0.38	23.9	-331.6	38,467	6.36
MW126	**07 Jun 2023**	1.08	19.4	-270.5	33,877	7.08
MW126	**05 Sep 2023**	0.74	19.5	-249.2	18,622	7.17
MW127	**03 Aug 2017**	0.07	17.9	-298	23,100	7.08
MW127	**08 Jan 2020**	1.8	23.4		40,920	7.14
MW127	**31 Mar 2020**	0.52	23		39,878	7.11
MW127	**15 Jul 2020**	3.29	17.3	-222.5	34,614	7.11
MW127	**22 Sep 2020**	0.77	19.7	-158.7	43,370	7.31
MW127	**14 Dec 2020**	0.6	19.8	-210.3	36,014	7.15
MW127	**15 Mar 2021**	0.66	20.8	-264.4	38,542	7.32
MW127	**08 Jun 2021**	0.94	20.1		40,922	7.35
MW127	**30 Aug 2021**	0.77	18.5	-216	36,917	7.05
MW127	**16 Nov 2021**	0.77	18.5	-216	36,917	7.05
MW127	**10 Jan 2022**	0.55	22	-275.9	39,757	7.13
MW127	**14 Mar 2022**	0.57	23.2	-286.3	36,314	7.18
MW127	**07 Jun 2022**	0.53	19.9	-251.1	37,448	6.94
MW127	**05 Sep 2022**	1.11	20.5	-325	39,553	7.37
MW127	**12 Dec 2022**	0.78	21.5	-326.7	39,462	7.24
MW127	**13 Mar 2023**	1.15	23	-319.4	35,750	6.52
MW127	**07 Jun 2023**	0.74	20	-262.1	37,641	7.09
MW127	**05 Sep 2023**	0.28	18.5	-297.3	30,877	7.11
MW128	**03 Aug 2017**	1.3	19.9	45	605	7.42
MW128	**07 Jun 2022**	0.38	17.6	-193.4		7.28
MW128	**05 Sep 2022**	3.55	17.8	-36.7	866	7.42
MW128	**12 Dec 2022**	2.95	21.4	28	1,660	7.27
MW128	**07 Jun 2023**	2.68	18.6	-53.6	869	7.67
MW128	**05 Sep 2023**	1.87	19.7	4	889	7.41
MW139	**01 Aug 2017**	1.17	18.3	17	396	7.55
MW139	**15 Nov 2019**	0.26	21.1		3,743	7.56
MW139	**08 Jan 2020**	4.01	21.9		5,072	7.69
MW139	**30 Mar 2020**	4.23	20.9		10,494	7.17
MW139	**20 Jul 2020**	7.99	17.4	43.5	11,385	
MW139	**22 Sep 2020**	3.36	20.5	12.5	13,544	7.51
MW139	**14 Dec 2020**	2.45	21	15.4	6,350	7.45
MW139	**16 Mar 2021**	11.4	23.2	64.7	4,339	7.47
MW139	**08 Jun 2021**	1.92	16.9		3,013	7.71
MW139	**31 Aug 2021**	3.57	19.8	99.8	565	8.07
MW139	**18 Nov 2021**	0.97	19.7	12.9	4,228	
MW139	**10 Jan 2022**	2.27	22.1	-7	1,484	8.26
MW139	**15 Mar 2022**	1.5	23.1	-142.8	12,140	7.59
MW139	**08 Jun 2022**	1.23	19.1	70.5	5,386	7.64
MW139	**05 Sep 2022**	2.34	17.6	86.6	839	7.9
MW139	**14 Nov 2022**	2.77	20.4	-20.1	6,407	7.66
MW139	**12 Dec 2022**	3.25	20.5	129.8	1,921	7.26
MW139	**15 Mar 2023**	2.43	23.1	80.5	5,545	7.5
MW139	**07 Jun 2023**	1.42	18.9	-27.9	7,740	7.5
MW139	**11 Sep 2023**	1.68	20.9	-22.9	4,034	7.39
MW141	**01 Aug 2017**	0.12	17	-259	10,740	7.31
MW141	**15 Nov 2019**	1.39	20		22,099	7.08
MW141	**08 Jan 2020**	1.97	21.6		25,555	7.11
MW141	**30 Mar 2020**	6.24	20.5		26,742	7.16
MW141	**20 Jul 2020**	5.72	17.7	-4.2	15,605	
MW141	**23 Sep 2020**	1.39	19.1	-32.6	28,278	7.37
MW141	**14 Dec 2020**	1.04	21.3	-180.8	31,614	7.18
MW141	**16 Mar 2021**	0.69	21.8	-246.1	33,145	7.18
MW141	**08 Jun 2021**	0.57	19		33,953	7.06
MW141	**31 Aug 2021**	2.83	24.1	-161.8	14,365	7.13
MW141	**18 Nov 2021**	0.5	19.5	-239.9	26,705	7.01
MW141	**10 Jan 2022**	1.04	20.7	-177.6	22,349	7.25

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW141	**15 Mar 2022**	0.84	22.1	-82.3	26,489	7.11
MW141	**08 Jun 2022**	1.37	18.9	-219.5	33,277	7
MW141	**05 Sep 2022**	0.89	17.4	-203.8	24,328	7.1
MW141	**15 Nov 2022**	0.9	21	-258.5	28,574	7.04
MW141	**12 Dec 2022**	1.73	19.9	-249.2	23,723	6.96
MW141	**15 Mar 2023**	0.83	21.5	65.8	26,283	6.91
MW141	**07 Jun 2023**	1.15	18.2	-218.5	32,792	7.08
MW141	**11 Sep 2023**	1.69	20.4	-124.4	28,286	6.73
MW142	**01 Aug 2017**	1.59	16.5	91	6,490	7.57
MW142	**15 Nov 2019**	0.16	21.2		28,355	7.19
MW142	**08 Jan 2020**	2.55	21.5		24,002	7.2
MW142	**30 Mar 2020**	1.69	21.4		24,703	6.93
MW142	**20 Jul 2020**	1.74	17.7	1.3	16,821	
MW142	**23 Sep 2020**	3.74	16.6	26	39,939	7.4
MW142	**14 Dec 2020**	1.89	19.3	-65.8	38,842	7.27
MW142	**16 Mar 2021**	0.84	23.9	-76.2	41,270	7.28
MW142	**08 Jun 2021**	2.63	18.7		37,490	7.34
MW142	**30 Aug 2021**	2.18	18.3	-97.8	25,163	7.74
MW142	**10 Jan 2022**	2.2	20.7	-75.6	28,910	7.24
MW142	**15 Mar 2022**	2.27	22.1	47.4	34,445	7.24
MW142	**08 Jun 2022**	0.56	19.7	-142.5	30,614	7.29
MW142	**05 Sep 2022**	0.88	16.9	29.3	23,846	7.24
MW142	**12 Dec 2022**	0.73	20.6	-131.5	33,446	7.35
MW142	**15 Mar 2023**	0.52	22.4	-9.9	34,518	7.03
MW142	**07 Jun 2023**	1.45	18.1	-41	36,490	7.03
MW142	**11 Sep 2023**	4.45	18.6	-72.2	30,127	6.84
MW147	**01 Aug 2017**	0.11	19	-316	8.31	7.15
MW147	**20 Jul 2020**	5.38	17.6	-31.6	13,855	
MW147	**15 Mar 2023**	1.09	21.5	-66.5	29,572	7.12
MW147	**07 Jun 2023**	2.24	17.2	-180.2	22,197	7.1
MW147	**11 Sep 2023**	3.43	20.5	-32.1	9,112	6.86
MW149	**01 Aug 2017**	2.49	15.1	114	19,530	7.41
MW149	**15 Nov 2019**	0.32	19.8		35,004	7.28
MW149	**08 Jan 2020**	2.59	21.4		27,039	7.34
MW149	**30 Mar 2020**	4.5	20.3		34,240	7.31
MW149	**20 Jul 2020**	6.1	16.3	8.2	18,049	
MW149	**23 Sep 2020**	6.23	13.7	141.1	42,411	7.62
MW149	**14 Dec 2020**	0.69	23.9	49.5	55,331	8.04
MW149	**16 Mar 2021**	9.5	20.8	73.1	53,451	7.39
MW149	**08 Jun 2021**	0.83	16.1		49,531	7.24
MW149	**30 Aug 2021**	5.05	16	50.9	51,642	7.87
MW149	**18 Nov 2021**	2	23.6	-38	45,923	7.4
MW149	**10 Jan 2022**	1.71	20.2	-41.9	41,460	7.65
MW149	**15 Mar 2022**	2.09	22.6	-82.8	52,750	7.66
MW149	**08 Jun 2022**	2.07	18.1	-162.3	44,848	7.72
MW149	**05 Sep 2022**	3.94	15.2	44.9	44,742	7.69
MW149	**15 Nov 2022**	1.25	20	-121.3	46,152	7.53
MW149	**12 Dec 2022**	1.41	20.9	-7.9	19,444	7.67
MW149	**15 Mar 2023**	0.99	22	27.6	48,864	7.44
MW149	**07 Jun 2023**	1.76	17.8	-15.1	50,393	7.32
MW149	**11 Sep 2023**	2.25	19.9	-22.4	26,455	7.09
MW158	**07 Aug 2017**	0.18	19.1	31	11,380	7.39
MW158	**01 Nov 2019**	0.5	20.5		13,583	7.11
MW158	**31 Mar 2020**	1.34	21.3		13,069	7.24
MW158	**21 Jul 2020**	6.06	17.1	41.6	10,131	
MW158	**21 Sep 2020**	1.13	19.5	-85.8	14,358	7.4
MW158	**14 Dec 2020**	1.96	20.5	-103.8	12,880	7.33
MW158	**15 Mar 2021**	1.49	22.4	45.6	16,445	7.3
MW158	**10 Jun 2021**	1.93	21.1		14,380	7.76
MW158	**30 Aug 2021**	2.51	19.7	101.4	13,576	7.25
MW158	**16 Nov 2021**	2.51	19.7	101.4	13,576	7.25
MW158	**15 Mar 2022**	1.18	21.9	62.8	15,124	7.19
MW158	**07 Jun 2022**	8.25	20.4	-92.6	13,181	7.16
MW158	**05 Sep 2022**	1.67	19.3	52.6	11,811	7.28
MW158	**12 Dec 2022**	1.53	20.8	27.5	15,086	7.28
MW158	**13 Mar 2023**	0.97	21.7	93.1	13,868	7.26
MW158	**14 Jul 2023**		19.2	-25.1	12,635	7.12
MW158	**04 Sep 2023**	4.1	19.3	-7.9	7,198	7.33
MW161	**07 Aug 2017**	0.55	19.8	114	3,460	7.38
MW161	**01 Nov 2019**	3.02	20.8		3,503	7.24
MW161	**21 Jul 2020**	6.63	18.5	26.7	3,034	
MW161	**21 Sep 2020**	1.43	19.4	44.6	4,048	7.3
MW161	**14 Dec 2020**	2.18	21.2	55.5	3,354	7.3
MW161	**15 Mar 2021**	1.94	22.3	56.4	3,843	7.45
MW161	**10 Jun 2021**	0.64	20.9		3,886	7.28
MW161	**30 Aug 2021**	2.71	20.2	88.1	3,193	7.46
MW161	**15 Nov 2021**	1.91	22.3	10.3	3,453	7.54
MW161	**16 Nov 2021**	2.71	20.2	88.1	3,193	7.46
MW161	**10 Jan 2022**	2.82	21.3	-64.6	3,518	7.53
MW161	**15 Mar 2022**	1.1	22	54.5	3,893	7.34
MW161	**04 May 2022**	1.9	19.4	135.6	3,337	7.3
MW161	**07 Jun 2022**	8.31	20.4	-1.4	3,175	7.29
MW161	**05 Sep 2022**	3.74	19.9	17.3	3,152	7.54
MW161	**12 Dec 2022**	2.78	20.7	-16.4	2,871	7.58
MW161	**13 Mar 2023**	1.9	22	89.8	2,971	7.49
MW161	**09 May 2023**	1.16	20.9	92	2,953	7.31
MW161	**14 Jul 2023**	11.35	19.1	62.7	2,082	8.18
MW161	**04 Sep 2023**	3.27	19.9	-12.2	3,443	7.52
MW166	**07 Aug 2017**	0.1	19	93	3,210	6.6
MW166	**01 Nov 2019**	1.59	21.9		3,547	7.21
MW166	**01 Apr 2020**	2.53	18.3		4,328	7.24
MW166	**21 Jul 2020**	4.1	17.4	29.7	3,556	
MW166	**22 Sep 2020**	10.72	16.5	86.1	3,972	7.72
MW166	**14 Dec 2020**	1.36	19.8	-36.3	3,668	7.33
MW166	**15 Mar 2021**	1.74	26	28.8	5,043	7.41
MW166	**10 Jun 2021**	2.44	19.2		5,572	7.53

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW166	**30 Aug 2021**	1.07	19.6	43.5	3,888	7.4
MW166	**15 Nov 2021**	2.94	21.7	11.7	3,820	7.55
MW166	**16 Nov 2021**	1.07	19.6	43.5	3,888	7.4
MW166	**10 Jan 2022**	2.13	21.5	-84.1	3,798	7.37
MW166	**15 Mar 2022**	1.31	20.8	56.7	4,681	7.36
MW166	**04 May 2022**	1.6	19	145.3	4,992	7.46
MW166	**07 Jun 2022**	8.84	19.2	-67.6	3,170	7.34
MW166	**05 Sep 2022**	1.16	19.1	43.3	3,797	7.41
MW166	**12 Dec 2022**	3.26	19.9	-19.2	3,725	7.31
MW166	**13 Mar 2023**	3.2	21.5	86.9	3,901	7.29
MW166	**09 May 2023**	2.37	19.5	81.8	3,932	7.38
MW166	**14 Jul 2023**	3.03	18.6	54.3	3,162	7.36
MW166	**04 Sep 2023**	4.08	18.9	-27.7	3,749	7.34
MW171	**07 Aug 2017**	0.31	18.2	-276	6,558	7.31
MW171	**30 Oct 2019**	1.93	21.4		7,503	7.31
MW171	**01 Apr 2020**	6.2	20.7		14,371	7.25
MW171	**21 Jul 2020**	2.53	17.9	-44.2	3,785	
MW171	**14 Dec 2020**	1.77	19.3	-219.2	6,683	7.11
MW171	**15 Mar 2021**	1.26	25.9	-226.5	8,569	7.32
MW171	**10 Jun 2021**	0.83	19.9		15,776	
MW171	**30 Aug 2021**	2.14	19.6	-117.4	10,080	7.3
MW171	**15 Nov 2021**	0.74	21.9	-9.8	6,690	7.47
MW171	**16 Nov 2021**	2.14	19.6	-117.4	10,080	7.3
MW171	**10 Jan 2022**	0.88	20.9	67	13,570	7.31
MW171	**15 Mar 2022**	0.59	21.4	-212.7	13,905	7.36
MW171	**04 May 2022**	0.7	21.3	-19.2	17,398	7.14
MW171	**07 Jun 2022**	16.23	19.9	-205.3	12,891	7.16
MW171	**05 Sep 2022**	4.88	18.8	71.3	14,325	7.32
MW171	**12 Dec 2022**	0.91	20.1	-157.9	14,483	7.19
MW171	**13 Mar 2023**	1.87	21.2	84.1	16,011	7.17
MW171	**09 May 2023**	1.24	19.4	80.2	7,168	7.41
MW171	**14 Jul 2023**		19.5	59.2	5,980	7.42
MW171	**04 Sep 2023**	2.36	19.4	-31.3	6,989	7.31
MW172	**07 Aug 2017**	0.12	18.1	-126	11,080	7.11
MW172	**08 Jun 2022**	0.66	16.9	88.1		7.39
MW172	**06 Sep 2022**	3.99	16.4	-156.3	3,777	7.42
MW172	**12 Dec 2022**	1.59	21.7	-195.2	5,819	7.62
MW172	**13 Mar 2023**	3.1	22.8	88.5	5,703	7.49
MW173	**09 Aug 2017**	0.16	19.2	-138	5,690	7.36
MW173	**15 Nov 2019**	10.41	22.6		4,505	7.56
MW173	**31 Mar 2020**	1.82	23		7,064	7.16
MW173	**22 Jul 2020**	5.35	20.2	-201	3,765	7.59
MW173	**16 Mar 2021**	1.5	24.6	-1,900	3,586	7.53
MW173	**10 Jun 2021**	0.53	21.8		4,549	7.23
MW173	**15 Nov 2021**	0.8	21.6	-43	2,657	7.18
MW173	**15 Mar 2022**	1.85	24.6	57.9	3,686	7.37
MW173	**04 May 2022**	1	20.1	0.3	4,335	7.29
MW173	**08 Jun 2022**	1.43	19.6	-164.6	4,602	7.31
MW173	**05 Sep 2022**	7.69	20.1	-28.1	3,927	7.63
MW173	**18 Nov 2022**	2.45	17.3	-79.4	4,533	7.53
MW173	**12 Dec 2022**	2.96	22.7	44.7	3,335	7.08
MW173	**13 Mar 2023**	0.86	23.2	62.7	3,690	7
MW173	**09 May 2023**	1.27	21.6	102.4	3,527	6.96
MW173	**06 Jun 2023**	1.85	17.7	80.6	3,760	7.2
MW173	**14 Jul 2023**	3	20.5	-98.9	5,319	7.34
MW173	**04 Sep 2023**	2.2	21.3	-50.6	4,203	7.16
MW193	**08 Aug 2017**	0.17	19.7	191	3,330	7.34
MW193	**28 Oct 2019**	0.61	20.7		3,023	6.92
MW193	**08 Jan 2020**	1.52	20.5		3,789	6.97
MW193	**31 Mar 2020**	2.47	22.5		4,411	7.24
MW193	**15 Jul 2020**	5.88	19	-49.2	3,925	7.39
MW193	**16 Dec 2020**	1.42	21.4	-116.7	3,257	7.08
MW193	**16 Mar 2021**	1.14	26.8	-119	3,820	7.23
MW193	**10 Jun 2021**	0.23	20.7		3,135	7.63
MW193	**30 Aug 2021**	1.89	19.1	-86.2	3,759	7.33
MW193	**16 Nov 2021**	1.89	19.1	-86.2	3,759	7.33
MW193	**10 Jan 2022**	1.08	22.7	-132.8	3,540	7.2
MW193	**15 Mar 2022**	1.38	22.3	-53	4,066	7.48
MW193	**07 Jun 2022**	2.52	19.3	-286.6	4,079	7.2
MW193	**05 Sep 2022**	1.09	20.2	-237.7	3,201	7.37
MW193	**12 Dec 2022**	1.75	20.5	22.5	2,379	7.23
MW193	**13 Mar 2023**	1.08	22.8	53.6	3,166	7.28
MW193	**06 Jun 2023**	2.15	18.1	-11.4	3,676	7.37
MW193	**04 Sep 2023**	3.71	20.2	-20.8	1,741	7.38
MW195D	**09 Aug 2017**	0.01	19	-169	21,260	7.42
MW195D	**28 Oct 2019**	0.66	20.7		26,949	7.27
MW195D	**08 Jan 2020**	4.52	20.5		17,425	7.9
MW195D	**31 Mar 2020**	0.44	21.9		25,679	7.47
MW195D	**15 Jul 2020**	0.81	19.9	-52.7	17,155	7.68
MW195D	**21 Sep 2020**	0.73	20.3	37.3	35,243	7.18
MW195D	**16 Dec 2020**	1.25	21.2	-96.6	34,195	7.43
MW195D	**16 Mar 2021**	0.72	23.5	-135	30,467	7.5
MW195D	**09 Jun 2021**	2.91	17.4		26,805	8
MW195D	**30 Aug 2021**	0.97	19.6	-94.9	30,466	7.5
MW195D	**15 Nov 2021**	1.42	23.1	-38.3	27,836	7.29
MW195D	**16 Nov 2021**	0.97	19.6	-94.9	30,466	7.5
MW195D	**10 Jan 2022**	0.96	21.9	-134.9	31,589	7.53
MW195D	**15 Mar 2022**	0.71	22.5	-104.5	32,683	6.79
MW195D	**04 May 2022**	0.6	19.4	31	26,279	7.26
MW195D	**07 Jun 2022**	11.71	19.7	-76.2	32,780	7.28
MW195D	**05 Sep 2022**	7.54	19.2	0.5	23,420	7.35
MW195D	**18 Nov 2022**	1.87	17.1	-50.4	2,458	7.59
MW195D	**12 Dec 2022**	1.5	21	-54.9	37,788	7.37
MW195D	**13 Mar 2023**	1.38	22.5	-149.5	24,740	7.12
MW195D	**09 May 2023**	1.14	22.8	-41.6	25,903	7.33
MW195D	**06 Jun 2023**	0.94	17.7	-126.6	32,740	7.45

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW195D	**14 Jul 2023**		19.5	-58.6	24,998	7.43
MW195D	**04 Sep 2023**	1.86	20.3	-59.2	26,144	7.35
MW195S	**09 Aug 2017**	0.01	19.7	-242	1,724	7.16
MW195S	**08 Jan 2020**	3.17	21.2		4,526	7.24
MW195S	**31 Mar 2020**	2.52	21.8		4,976	7.36
MW195S	**15 Jul 2020**	1.39	19.7	33.3	4,189	7.35
MW195S	**21 Sep 2020**	0.38	20.4	-8	9,189	7.06
MW195S	**16 Dec 2020**	3.05	21.2	-30.2	4,742	7.31
MW195S	**16 Mar 2021**	2.85	25.9	-38.5	5,102	7.28
MW195S	**09 Jun 2021**	2.54	18.9		5,810	7.78
MW195S	**30 Aug 2021**	1.88	19.9	1	5,972	7.32
MW195S	**16 Nov 2021**	1.88	19.9	1	5,972	7.32
MW195S	**10 Jan 2022**	1.66	22.6	1.9	4,745	7.37
MW195S	**15 Mar 2022**	0.95	22	71.5	5,711	7.14
MW195S	**07 Jun 2022**	17.16	20.9	-15	5,194	7.21
MW195S	**05 Sep 2022**	1.31	19.7	29	5,351	7.25
MW195S	**12 Dec 2022**	1.37	21.4	-9.5	5,723	7.25
MW195S	**13 Mar 2023**	1.22	23.1	34.5	4,419	7.22
MW195S	**06 Jun 2023**	1.76	17.7	0.4	4,148	7.08
MW196	**08 Aug 2017**	3.26	20	63	548	7.22
MW196	**29 Oct 2019**	3.48	21.5		622	7.57
MW196	**02 Apr 2020**	7.13	21.2		632	7.75
MW196	**22 Jul 2020**	5.29	20.4	-109.1	876	7.71
MW196	**24 Sep 2020**	7.38	18.6	35.3	746	7.78
MW196	**16 Dec 2020**	2.26	20.6	-15.1	614	7.64
MW196	**10 Jun 2021**	4.27	20.8		690	8.32
MW196	**30 Aug 2021**	4.68	20.8	-148.7	652	8.1
MW196	**16 Nov 2021**	4.68	20.8	-148.7	652	8.1
MW196	**14 Mar 2022**	4.09	22.9	131.1	620	7.93
MW196	**06 Sep 2022**	4.19	20.7	125.4	605	7.73
MW196	**13 Dec 2022**	7.37	17.9	122.5	925	7.41
MW196	**13 Mar 2023**	5.2	22.6	116.8	617	7.79
MW196	**14 Jul 2023**	10.1	19.1	-71.2	550	7.64
MW197	**09 Aug 2017**	0.06	16.9	116	7,350	7.17
MW197	**31 Mar 2020**	1.35	22		4,865	7.55
MW197	**16 Mar 2021**	2.95	23.5	4.5	7,341	7.61
MW197	**09 Jun 2021**	2.84	18.5		7,000	8.05
MW197	**01 Sep 2021**	2.78	19.3	15.6	7,303	7.68
MW197	**07 Jun 2022**	6.1	19.5	1.9	4,164	7.23
MW197	**05 Sep 2022**	2.5	18.2	91.1	3,358	7.43
MW197	**12 Dec 2022**	3.35	20.2	59.1	2,990	7.59
MW197	**14 Mar 2023**	1.18	22.7	75.9	3,324	7.59
MW197	**07 Jun 2023**	1.55	19	78.4	10,714	7.45
MW197	**14 Jul 2023**	0.36	19.4	53.4	3,091	7.55
MW199	**08 Aug 2017**	0.16	20.4	-111	15,950	7.44
MW199	**29 Oct 2019**	0.22	21		24,015	7.09
MW199	**08 Jan 2020**	9.07	21.3		70.6	7.81
MW199	**31 Mar 2020**	3.68	23.4		21,776	7.21
MW199	**15 Jul 2020**	3.59	19	106.1	3,345	7.69
MW199	**21 Sep 2020**	2.9	19.7	-202.3	21,776	7.16
MW199	**16 Dec 2020**	2.31	22	-24.5	4,121	7.54
MW199	**30 Aug 2021**	3.16	20.5	-154.4	1,292	7.67
MW199	**16 Nov 2021**	3.16	20.5	-154.4	1,292	7.67
MW199	**10 Jan 2022**	2.28	22.5	-120.4	14,294	7.48
MW199	**17 Mar 2022**	2.13	21.2	118.3	8,752	7.01
MW199	**07 Jun 2022**	8.77	20	42.3	11,349	7.27
MW199	**05 Sep 2022**	4.39	20.5	42.8	6,473	7.52
MW199	**12 Dec 2022**	1.03	21.3	4.3	10,542	7.37
MW199	**13 Mar 2023**	1.21	22.6	87.8	12,823	7.26
MW199	**06 Jun 2023**	2.05	18.5	99.3	2,641	7.32
MW199	**14 Jul 2023**	4.22	19.9	-117.3	806	7.42
MW200	**09 Aug 2017**	0.92	17.8	147	6,960	7.16
MW200	**11 Nov 2019**	0.18	20.3		2,089	7.13
MW200	**31 Mar 2020**	1.48	23.6		5,697	7.73
MW200	**15 Jul 2020**	10.57	17.7	-49.5	8,090	7.42
MW200	**24 Sep 2020**	4.97	20.8	17.1	9,988	8.06
MW200	**15 Dec 2020**	3.15	23.9	-92.1	8,837	7.66
MW200	**16 Mar 2021**	2.16	26.2	23.5	11,389	7.41
MW200	**09 Jun 2021**	3.9	18.5		9,354	7.99
MW200	**01 Sep 2021**	2.32	18.1	44.1	7,822	7.89
MW200	**16 Nov 2021**	0.39	19.6	-35.2	6,524	7.64
MW200	**10 Jan 2022**	2.32	22.5	-34.7	7,646	7.79
MW200	**14 Mar 2022**	1.72	24.8	-77.9	10,507	7.59
MW200	**05 May 2022**	0.4	22.6	126.1	10,637	7.14
MW200	**07 Jun 2022**	8.39	20.2	57.4	10,280	7.61
MW200	**05 Sep 2022**	6.75	18.9	42.7	7,487	7.81
MW200	**17 Nov 2022**	1.4	19.4	-27.8	6,422	7.51
MW200	**12 Dec 2022**	2.04	20.7	45.4	7,544	7.54
MW200	**14 Mar 2023**	1.34	23.1	18.3	8,944	7.38
MW200	**09 May 2023**	0.16	21.9	93.3	8,973	7.2
MW200	**07 Jun 2023**	1.56	18.8	78.9	10,704	7.45
MW200	**14 Jul 2023**	0.13	19.9	-130.2	8,116	7.32
MW200	**05 Sep 2023**	2.33	19.6	-48.9	8,461	7.58
MW202	**09 Aug 2017**	0.19	18.4	-149	1,656	7.38
MW202	**31 Mar 2020**	1.64	22.9		1,350	8.01
MW202	**22 Jul 2020**	4.37	17.6	6.5	1,985	7.69
MW202	**21 Sep 2020**	2.24	17.7	111.3	981	7.48
MW202	**16 Dec 2020**	1.64	21.5	-14.5	1,209	7.54
MW202	**15 Mar 2021**	8.8	21.4	86.8	1,487	7.7
MW202	**10 Jun 2021**	1.08	21.1		2,432	7.57
MW202	**30 Aug 2021**	2.16	19.2	-127.5	1,493	7.6
MW202	**16 Nov 2021**	2.16	19.2	-127.5	1,493	7.6
MW202	**12 Jan 2022**	1.53	23.3	45.3	1,374	7.47
MW202	**08 Jun 2022**	1.42	18	56		7.76
MW202	**05 Sep 2022**	4.12	19.1	-194.7	3,310	7.56
MW202	**12 Dec 2022**	1.76	21	-127.3	1,883	7.56

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW202	**13 Mar 2023**	2.84	22.5	-159.7	1,762	6.97
MW202	**07 Jun 2023**	1.15	26.9	13.4	2,438	7.63
MW202	**05 Sep 2023**	3.63	20.8	-44	2,255	7.61
MW203	**09 Aug 2017**	0.96	16.3	53	1,386	7.5
MW203	**08 Nov 2019**	3.51	22.2		1,511	7.54
MW203	**31 Mar 2020**	1.3	22.8		1,369	7.59
MW203	**15 Jul 2020**	1.84	19.4	72.6	1,314	7.77
MW203	**22 Sep 2020**	3.17	18.1	111.1	822	7.44
MW203	**16 Dec 2020**	1.78	22.2	-18.8	985	7.61
MW203	**16 Mar 2021**	1.97	23.8	21	1,013	7.89
MW203	**09 Jun 2021**	3.38	18.9		1,010	8.09
MW203	**30 Aug 2021**	5.44	21	-141.6	835	7.81
MW203	**16 Nov 2021**	5.44	21	-141.6	835	7.81
MW203	**10 Jan 2022**	1.51	21.9	-76.5	2,421	7.68
MW203	**17 Mar 2022**	2.08	22.2	-39.5	1,100	7.62
MW203	**07 Jun 2022**	3.02	20.6	-4.5	995	7.91
MW203	**06 Sep 2022**	1.74	18.8	-63.3	957	7.79
MW203	**12 Dec 2022**	3.76	23	-169.5	990	7.94
MW203	**13 Mar 2023**	3.98	23.8	-246.8	229.1	7.29
MW203	**06 Jun 2023**	2.57	19.2	127.6	1,061	7.51
MW203	**14 Jul 2023**	5.68	20.8	-38.4	1,367	7.82
MW203	**05 Sep 2023**	2.67	21.7	-86.4	2,758	7.87
MW214	**02 Aug 2017**	4.56	17.1	127	1,574	7.4
MW214	**01 Sep 2021**	3.88	18.2	-138.8	2,914	7.28
MW214	**16 Nov 2021**	3.88	18.2	-138.8	2,914	7.28
MW214	**07 Jun 2022**	1.51	13.1	-93.6		7.05
MW214	**06 Sep 2022**	3.82	16.5	-46.7	2,212	7.04
MW214	**13 Dec 2022**	1.33	18.3	-85.9	2,886	7.25
MW214	**14 Mar 2023**	1.33	20.3	36.1	8,127	7.32
MW214	**08 Jun 2023**	1.77	18.7	-135.3	3,370	7.29
MW215	**02 Aug 2017**	2.38	18	113	901	7.62
MW215	**01 Sep 2021**	1.7	18.9	-26.2	1,446	8.15
MW215	**07 Jun 2022**	1.72	17.2	-51.5		7.46
MW215	**06 Sep 2022**	3.66	16.4	-30.8	1,293	7.56
MW215	**13 Dec 2022**	1.88	18.1	-24.7	1,887	7.6
MW215	**14 Mar 2023**	1.9	20.9	68.1	2,103	7.39
MW215	**08 Jun 2023**	1.64	18.9	-127.6	2,907	7.27
MW216	**02 Aug 2017**	1.31	16.6	68	906	7.61
MW216	**19 Dec 2019**	3.95	18.6		1,142	7.53
MW216	**31 Mar 2020**	7.38	20		1,479	7.27
MW216	**22 Jul 2020**	4.81	19.6	25.4	1,304	7.39
MW216	**15 Dec 2020**	2.02	20.9	0.6	1,592	7.25
MW216	**18 Mar 2021**	2.26	21	118.1	1,753	7.52
MW216	**09 Jun 2021**	3.69	18.4		1,753	7.78
MW216	**31 Aug 2021**	3.77	22	7.6	2,545	7.73
MW216	**16 Mar 2022**	3	20.1	-41.7	2,296	7.17
MW216	**07 Jun 2022**	1.09	15.6	-20.1		7.41
MW216	**05 Sep 2022**	4.39	18.2	12	2,104	7.53
MW216	**13 Dec 2022**	3.08	18	-68.7	5,561	7.54
MW216	**14 Mar 2023**	1.84	20.1	58.8	5,002	7.38
MW216	**08 Jun 2023**	1.67	18.8	3	4,647	7.34
MW216	**14 Jul 2023**	1	18.7	97.1	2,980	7.07
MW216	**04 Sep 2023**	2.54	19.4	-19	2,816	7.26
MW217	**02 Aug 2017**	5.34	18.7	120	731	7.42
MW217	**18 Dec 2019**	4.8	21.7		332.1	7.23
MW217	**31 Mar 2020**	6.59	23.5		483.2	8.04
MW217	**22 Jul 2020**	5.86	22.8	-18.3	637	7.62
MW217	**24 Sep 2020**	7.29	21.7	99.3	2,381	8.08
MW217	**15 Dec 2020**	4.4	21.8	-7.8	504	7.72
MW217	**18 Mar 2021**	4.33	22.5	61.4	958	7.58
MW217	**09 Jun 2021**	6.87	19.3		733	8.12
MW217	**31 Aug 2021**	5.62	20.1	-118.9	1,170	7.57
MW217	**16 Nov 2021**	5.62	20.1	-118.9	1,170	7.57
MW217	**18 Nov 2021**	6.14	20.7	12.5	945	7.48
MW217	**13 Jan 2022**	2.16	21.5	105.8	1,005	7
MW217	**17 Mar 2022**	6.59	22.2	-11.3	957	7.62
MW217	**08 Jun 2022**	1.43	17.3	79.2		7.65
MW217	**08 Sep 2022**	5.52	17.8	-43.3	1,122	7.53
MW217	**16 Nov 2022**	5.73	24.8	9.4	1,017	7.49
MW217	**13 Dec 2022**	5.03	19.8	-15.4	1,133	6.84
MW217	**15 Mar 2023**	5.58	21.4	1,262	1,053	7.45
MW217	**08 Jun 2023**	5.11	19.3	71.6	795	7.4
MW217	**14 Jul 2023**	5.1	18.7	51.1	532	7.39
MW217	**04 Sep 2023**	6.02	20.4	-20.2	798	7.47
MW220	**02 Aug 2017**	4	17.2	145	1,621	7.11
MW220	**13 Jan 2022**	2.69	20.2	87.1	993	7.34
MW220	**08 Jun 2022**	1.21	18.7	109.5		7.69
MW220	**08 Sep 2022**	4.98	15.2	34.6	815	7.52
MW220	**16 Nov 2022**	1.182	23.1	-9.9	789	7.48
MW220	**13 Dec 2022**	1.23	18.7	-121.3	687	7.25
MW220	**15 Mar 2023**	1.93	20.6	117.8	773	7.46
MW220	**08 Jun 2023**	1.89	18.7	60.8	803	7.43
MW220	**14 Jul 2023**		18.6	53.5	579	7.38
MW220	**04 Sep 2023**	3.2	20.2	-18.8	727	7.26
MW224	**09 Aug 2017**	3.61	18.2	69	763	7.74
MW224	**18 Dec 2019**	7.9	21.9		427.3	7.66
MW224	**31 Mar 2020**	5.75	20		794	7.22
MW224	**22 Jul 2020**	5.15	20	10	826	7.65
MW224	**24 Sep 2020**	5.74	19.3	103.4	1,788	8.06
MW224	**15 Dec 2020**	4.66	21	-6.8	835	7.73
MW224	**18 Mar 2021**	4.49	21.1	65.1	894	7.84
MW224	**09 Jun 2021**	6.51	18.5		860	8.04
MW224	**31 Aug 2021**	6.18	19.1	-11,105	905	7.7
MW224	**16 Nov 2021**	6.18	19.1	-11,105	905	7.7
MW224	**13 Jan 2022**	3.71	20.9	85.9	900	7.64
MW224	**17 Mar 2022**	7.03	21.3	17.5	857	7.96

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW224	**08 Jun 2022**	1.13	17.1	120		7.73
MW224	**08 Sep 2022**	7.54	18.3	-89.5	814	7.81
MW224	**13 Dec 2022**	5.19	18.9	17.1	829	7.59
MW224	**15 Mar 2023**	6.5	20.4	113.2	911	7.74
MW224	**08 Jun 2023**	5.81	18.2	65.3	885	7.75
MW224	**14 Jul 2023**	7.13	20.4	53.3	917	7.61
MW224	**04 Sep 2023**	9.55	20.3	-25.2	13.9	7.85
MW225	**02 Aug 2017**	1.82	18.6	48	1,289	7.45
MW225	**01 Sep 2021**	2.26	18.2	-163.9	2,008	7.6
MW225	**16 Nov 2021**	2.26	18.2	-163.9	2,008	7.6
MW225	**16 Mar 2022**	1.34	20.4	-194.3	2,872	7.62
MW225	**07 Jun 2022**	0.86	18.8	-216.5		7.43
MW225	**06 Sep 2022**	4.42	15.5	5.6	1,548	7.5
MW225	**13 Dec 2022**	3.4	17.9	-1.8	2,012	7.45
MW225	**14 Mar 2023**	0.92	21.6	63	2,291	7.37
MW225	**08 Jun 2023**	1.9	19.2	-131.5	4,700	7.25
MW225	**04 Sep 2023**	9.39	19.2	-2.8	177	7.83
MW226	**02 Aug 2017**	0.19	18.5	41	23,200	7.15
MW226	**14 Jan 2020**	6.15	25.4		43,562	7.17
MW226	**02 Apr 2020**	5.29	22.2		40,885	6.92
MW226	**21 Jul 2020**	12.22	18.7	-22.5	37,338	7.11
MW226	**22 Sep 2020**	2.26	19.3	53	42,211	7.26
MW226	**15 Dec 2020**	1.02	21.9	-40.2	43,297	7.1
MW226	**17 Mar 2021**	1	23.2	-121.6	44,123	7.09
MW226	**10 Jun 2021**	0.9	20.8		43,023	7.16
MW226	**31 Aug 2021**	2.42	19.7	-197.1	43,481	7.52
MW226	**16 Mar 2022**	0.66	23.9	-168.5	43,451	7.11
MW226	**07 Jun 2022**	0.75	19.1	-99.4		7.16
MW226	**06 Sep 2022**	0.72	18.2	-191.7	38,453	7.08
MW226	**13 Dec 2022**	0.93	19.8	-126.4	39,126	7.14
MW226	**14 Mar 2023**	0.71	22.8	-66.2	36,780	6.39
MW226	**08 Jun 2023**	0.75	19.8	-152.1	43,015	7.09
MW226	**14 Jul 2023**	0.08	18.7	-65.9	3,292	7.41
MW226	**04 Sep 2023**	2.66	19.6	-16.6	41,286	7.12
MW227	**02 Aug 2017**	0.43	18	-169	3.39	7.37
MW227	**01 Apr 2020**	0.51	23.2		4,461	7.32
MW227	**22 Jul 2020**	4.38	17.6	-6.2	3,530	
MW227	**21 Sep 2020**	2.9	20.8	-205.8	8,134	7.7
MW227	**15 Dec 2020**	1.1	21	-100.6	3,487	7.38
MW227	**15 Mar 2021**	0.61	21.6	-161.2	5,808	7.92
MW227	**10 Jun 2021**	1.94	20.3		3,101	7.6
MW227	**31 Aug 2021**	1.57	19.3	-135.6	4,600	8.03
MW227	**14 Jan 2022**	0.73	21.5	-62.4	5,867	7.59
MW227	**16 Mar 2022**	0.47	22.8	-197.1	7,043	7.49
MW227	**07 Jun 2022**	0.25	17.5	-220.5		7.39
MW227	**07 Sep 2022**	2.66	17.8	-62.1	4,064	7.19
MW227	**13 Dec 2022**	1.95	19	35.7	2,913	7.55
MW227	**14 Mar 2023**	1.03	24.1	-176.7	3,625	7.03
MW227	**08 Jun 2023**	0.98	18.7	-226.4	3,721	7.43
MW227	**14 Jul 2023**	0.08	18.7	-65.9	3,292	7.41
MW227	**05 Sep 2023**	2.94	18.5	166.5	2,912	7.39
MW228	**02 Aug 2017**	0.67	18.6	28	18,390	7.3
MW228	**14 Jan 2020**	5.48	25.8		24,107	7.49
MW228	**01 Apr 2020**	1.15	23.8		28,530	7.26
MW228	**22 Jul 2020**	2.2	18.2	11	15,397	
MW228	**21 Sep 2020**	2.25	19.9	-210.6	31,898	7.22
MW228	**15 Dec 2020**	0.89	20	-69.7	29,607	7.2
MW228	**15 Mar 2021**	0.57	23.3	-11,952	28,133	7.27
MW228	**10 Jun 2021**	0.72	20.7		34,475	7.38
MW228	**31 Aug 2021**	0.72	20.3	-64.5	24,402	7.49
MW228	**14 Jan 2022**	0.31	22.2	-243.4	19,836	7.28
MW228	**16 Mar 2022**	1.79	23.1	-161.7	16,409	7.5
MW228	**07 Jun 2022**	1.6	19.8	-136	73,403	7.6
MW228	**07 Sep 2022**	1.7	16.3	152.1	10,013	7.48
MW228	**13 Dec 2022**	3.1	18.4	-84.5	17,609	7.68
MW228	**14 Mar 2023**	1.67	23.8	-88.1	1,454	6.84
MW228	**08 Jun 2023**	0.81	19	-154.7	12,206	7.32
MW228	**14 Jul 2023**		19.1	19.3	20,389	7.14
MW228	**05 Sep 2023**	2.98	18.7	160.8	7,084	7.27
MW233	**08 Aug 2017**	0.06	17	-210	312	7.49
MW233	**12 Nov 2019**	0.12	16.6		354.2	7.64
MW233	**30 Mar 2020**	3.1	17.6		344	8.12
MW233	**15 Jul 2020**	2.55	16.5	80.2	272.4	8.28
MW233	**21 Sep 2020**	2.99	15.7	30.6	443.9	7.6
MW233	**15 Dec 2020**	1.65	17.3	-118.8	396.8	8.28
MW233	**15 Mar 2021**	20.4	18.9	-167.4	695	8.51
MW233	**09 Jun 2021**	2.03	15.7		419.5	7.82
MW233	**30 Aug 2021**	2.1	15.6	190.6	442.6	8.39
MW233	**08 Nov 2021**	2.06	18.1	-90.1	378.6	7.98
MW233	**10 Jan 2022**	3.59	20.6	-73.1	483.6	8.51
MW233	**17 Mar 2022**	3.32	18.8	-114.5	342.1	8.5
MW233	**03 May 2022**	0.6	18.2	-11.1	385.4	7.8
MW233	**08 Jun 2022**	2.27	16.7	-83	242.6	7.91
MW233	**06 Sep 2022**	4.62	14.7	-33.1	824	8.66
MW233	**15 Nov 2022**	1.59	22.3	13.6	462.9	7.81
MW233	**13 Dec 2022**	1.23	15.7	23.5	414.9	8.14
MW233	**13 Mar 2023**	2.52	19.7	23.6	331.7	8.32
MW233	**09 May 2023**	2.74	20.1	-1.7	328.8	8.02
MW233	**06 Jun 2023**	3.73	14.1	17.8	274	8.28
MW233	**04 Sep 2023**	3.67	16.8	-14.4	3,004	7.88
MW236	**08 Aug 2017**	2.25	20.3	222	622	7.38
MW236	**11 Oct 2019**	1.92	20.7		578	7.36
MW236	**02 Apr 2020**	5.92	22.4		579	7.62
MW236	**16 Jul 2020**	2.8	18.9	-10.9	969	8.01
MW236	**21 Sep 2020**	3.98	16.8	-2.4	574	7.65
MW236	**15 Dec 2020**	3.19	21	7.5	616	7.61

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW236	**16 Mar 2021**	2.59	24.2	97.6	776	7.5
MW236	**10 Jun 2021**	4.12	21.9		726	8.33
MW236	**31 Aug 2021**	4.77	18.5	69.9	776	7.57
MW236	**08 Nov 2021**	3.76	19.9	-10.1	882	7.53
MW236	**16 Nov 2021**	4.77	18.5	69.9	776	7.57
MW236	**10 Jan 2022**	2.94	23.6	49.9	816	7.66
MW236	**03 May 2022**	4	20.3	92.3	709	7.36
MW236	**07 Jun 2022**	3.29	19.5	24.7	632	7.71
MW236	**06 Sep 2022**	5.38	18.1	4.6	670	7.85
MW236	**15 Nov 2022**	4.52	20.2	-15.2	681	7.57
MW236	**13 Dec 2022**	3.63	19.6	79	715	7.77
MW236	**10 May 2023**	3.72	20.9	-3.9	669	7.62
MW236	**06 Jun 2023**	2.59	18.4	141.8	738	7.59
MW236	**05 Sep 2023**	3.58	19.9	118.5	662	7.66
MW238	**04 Aug 2017**	2.86	19.9	140	525	7.6
MW238	**21 Oct 2019**	4.56	20.8		553	7.55
MW238	**14 Jan 2020**	19.95	24.2		985	8.44
MW238	**01 Apr 2020**	1.3	21.3		696	7.48
MW238	**16 Jul 2020**	2.69	19.8	18.2	776	7.85
MW238	**21 Sep 2020**	4.64	18.1	31.5	616	7.74
MW238	**30 Sep 2020**	2.64	20.5	97.3	674	7.7
MW238	**15 Dec 2020**	1.51	22	-9.2	656	7.65
MW238	**15 Feb 2021**	46	23.6	104.9	639	7.39
MW238	**18 Mar 2021**	1.31	21.3	2.8	728	7.74
MW238	**10 Jun 2021**	2.58	21.3		779	8.44
MW238	**31 Aug 2021**	4.26	20.4	75.4	665	7.81
MW238	**16 Nov 2021**	4.26	20.4	75.4	665	7.81
MW238	**12 Jan 2022**	2.28	21.8	108.5	725	7.64
MW238	**09 Jun 2022**	1.93	19.8	-2.5	679	7.84
MW238	**06 Sep 2022**	4.37	18.2	76.5	636	7.83
MW238	**13 Dec 2022**	2.85	19.6	126.8	673	7.86
MW238	**15 Mar 2023**	0.97	21.8	89.2	764	7.59
MW238	**05 Sep 2023**	1.61	20.1	-17.5	347	7.55
MW239	**04 Aug 2017**	1.65	19.8	-98	561	7.42
MW239	**18 Oct 2019**	5.07	20.6		564	7.48
MW239	**22 Jul 2020**	6.11	17.8	16.3	18,786	
MW239	**21 Sep 2020**	5.38	16.7	38.5	561	7.79
MW239	**01 Oct 2020**	1.87	20.1	51.2	618	7.85
MW239	**15 Dec 2020**	1.03	21.3	9	635	7.6
MW239	**15 Feb 2021**	20.9	23.6	101.3	655	7.21
MW239	**18 Mar 2021**	1.44	22.8	96	709	7.83
MW239	**10 Jun 2021**	1.22	21		696	7.59
MW239	**31 Aug 2021**	5.22	20.5	72.3	581	7.84
MW239	**09 Nov 2021**	2.81	22.8	-127.3	710	7.68
MW239	**16 Nov 2021**	5.22	20.5	72.3	581	7.84
MW239	**12 Jan 2022**	4.52	21.2	105.6	476.1	7.75
MW239	**03 May 2022**	1	20	166.1	767	7.32
MW239	**09 Jun 2022**	3.61	19.9	1.3	643	7.79
MW239	**06 Sep 2022**	5.45	17.5	69.2	632	7.83
MW239	**13 Dec 2022**	3.29	17.3	120.3	634	7.86
MW239	**15 Mar 2023**	3.8	23.1	93.5	732	7.7
MW239	**09 May 2023**	2.4	23	22.5	657	7.67
MW239	**05 Sep 2023**	3	20.1	-12.6	758	7.55
MW240	**04 Aug 2017**	0.73	21	140	695	7.23
MW240	**21 Oct 2019**	1.14	21.8		779	7.25
MW240	**14 Jan 2020**	19.11	27.4		1,112	7.51
MW240	**01 Apr 2020**	4.01	23		888	7.51
MW240	**16 Jul 2020**	1.57	20.3	15.6	888	7.65
MW240	**21 Sep 2020**	1.76	18.2	18.8	755	7.4
MW240	**30 Sep 2020**	1.76	21.4	87.3	826	7.43
MW240	**15 Dec 2020**	1.43	22.6	-14.1	796	7.43
MW240	**15 Feb 2021**	0.67	23.5	124.7	960	7.36
MW240	**18 Mar 2021**	2.49	23.7	86.9	964	7.75
MW240	**10 Jun 2021**	1.5	21.4		942	8.28
MW240	**31 Aug 2021**	2.92	21.4	81.3	834	7.5
MW240	**16 Nov 2021**	2.92	21.4	81.3	834	7.5
MW240	**12 Jan 2022**	2.07	23	99.9	863	7.41
MW240	**09 Jun 2022**	2.34	20.2		897	7.64
MW240	**06 Sep 2022**	2.35	19.5	83.2	775	7.51
MW240	**13 Dec 2022**	2.22	19	134	774	7.65
MW240	**15 Mar 2023**	1.77	22.7	78	878	7.45
MW240	**05 Sep 2023**	1.84	21.4	-22.2	815	7.45
MW242	**07 Aug 2017**	1.57	21.9	30	579	7.65
MW242	**18 Oct 2019**	0.63	21.7		508	7.57
MW242	**30 Mar 2020**	1.39	21.2		493.2	7.98
MW242	**16 Jul 2020**	2.34	21.5	23.7	462.6	7.88
MW242	**21 Sep 2020**	2.77	19	-2.6	538	7.68
MW242	**01 Oct 2020**	1.03	22.5	73.8	609	7.63
MW242	**15 Dec 2020**	0.71	23.3	-12.9	653	7.68
MW242	**16 Feb 2021**	0.43	25	132.2	604	7.13
MW242	**18 Mar 2021**	2.43	23.6	39	36,676	7.42
MW242	**09 Jun 2021**	2.48	20.8		312.4	7.81
MW242	**31 Aug 2021**	3.52	21.8	84	901	7.71
MW242	**09 Nov 2021**	1.22	22.8	-9.3	704	7.6
MW242	**12 Jan 2022**	0.87	25.3	-105.4	1,508	8.01
MW242	**17 Mar 2022**	1.49	24.2	-73.6	477.1	7.89
MW242	**03 May 2022**	0.7	22	123.3	554	7.72
MW242	**08 Jun 2022**	1.65	22	-25	518.1	7.9
MW242	**06 Sep 2022**	3.18	17.8	59.4	700	7.86
MW242	**14 Nov 2022**	1.87	23	2.3	533.5	7.32
MW242	**13 Dec 2022**	1.13	20.8	155.2	497.4	7.58
MW242	**15 Mar 2023**	1.95	24.4	30.6	450.9	7.77
MW242	**09 May 2023**	1.67	24.9	8.4	442.1	7.77
MW242	**04 Sep 2023**	3.51	21.3	-30.2	249.7	7.84
MW243	**24 Oct 2019**	0.24	20.7		701	7.49
MW243	**14 Jan 2020**	5.55	23.4		450.5	7.62

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW243	**01 Apr 2020**	4	21.2		766	7.51
MW243	**16 Jul 2020**	3.25	19.9	14.8	868	7.74
MW243	**21 Sep 2020**	3.21	17.8	19.4	704	7.58
MW243	**30 Sep 2020**	1.17	20.4	69.5	775	7.53
MW243	**15 Dec 2020**	1.65	22.4	-9.2	825	7.58
MW243	**15 Feb 2021**	0.55	21.6	70.3	917	7.46
MW243	**18 Mar 2021**	2.29	21.7	-5.1	1,931	7.73
MW243	**10 Jun 2021**	3	20.2		825	7.65
MW243	**31 Aug 2021**	2.86	19.9	80.6	800	7.64
MW243	**09 Nov 2021**	1.85	19.8	-140.8	959	7.54
MW243	**16 Nov 2021**	2.86	19.9	80.6	800	7.64
MW243	**12 Jan 2022**	2.06	22.3	109.5	1,026	7.1
MW243	**03 May 2022**	1.7	19.3	174.2	1,171	6.19
MW243	**09 Jun 2022**	3.07	17.9	-3.4	908	7.74
MW243	**06 Sep 2022**	2.31	17.4	68	916	7.62
MW243	**14 Nov 2022**	1.67	23.2	1.4	987	7.55
MW243	**13 Dec 2022**	2.11	19.7	140.8	929	7.6
MW243	**15 Mar 2023**	2.03	21.3	58.8	969	7.49
MW243	**09 May 2023**	2.63	22.7	8.4	953	7.53
MW243	**05 Sep 2023**	2.78	19.3	-19.8	393	7.25
MW245	**04 Aug 2017**	0.05	19.3	-185	768	6.83
MW245	**21 Oct 2019**	0.13	20.3		722	6.9
MW245	**14 Jan 2020**	4.07	23.4		3,863	7.28
MW245	**01 Apr 2020**	1.63	21.5		900	7.07
MW245	**16 Jul 2020**	2.25	19.9	-0.5	1,238	7.15
MW245	**21 Sep 2020**	2.21	18.1	26.2	916	7.05
MW245	**30 Sep 2020**	1.12	20.3	-97.5	987	7.09
MW245	**15 Dec 2020**	1.67	21.3	-90.4	914	7.36
MW245	**15 Feb 2021**	0.01	22.6	-162.7	1,018	6.95
MW245	**18 Mar 2021**	2.11	21.9	-129.4	879	7.11
MW245	**10 Jun 2021**	0.88	21.8		1,155	7.36
MW245	**31 Aug 2021**	1.67	18.8	69.5	705	7.4
MW245	**09 Nov 2021**	0.64	21.1	-74.6	746	7.42
MW245	**16 Nov 2021**	1.67	18.8	69.5	705	7.4
MW245	**12 Jan 2022**	1.81	21.2	-47.7	754	7.26
MW245	**03 May 2022**	0.9	21	76.4	839	7.26
MW245	**09 Jun 2022**	2.69	18	-101.7	876	7.28
MW245	**06 Sep 2022**	0.85	15.1	46.2	723	7.29
MW245	**14 Nov 2022**	3.56	22.5	-5.7	644	7.47
MW245	**13 Dec 2022**	1.62	16.6	-40.3	611	7.62
MW245	**15 Mar 2023**	1.76	20.4	-104.3	627	7.35
MW245	**09 May 2023**	1.74	24.2	22	754	7.23
MW245	**05 Sep 2023**	3.26	20.2	-22.9	430.7	7.3
MW249	**07 Aug 2017**	-0.01	21.7	-200	1,775	7.34
MW249	**15 Nov 2019**	0.12	23.8		1,354	7.13
MW249	**30 Mar 2020**	2.63	21.2		998	7.51
MW249	**16 Jul 2020**	1.86	20.8	-11.3	1,308	7.63
MW249	**21 Sep 2020**	2.7	18.5	68	1,198	7.43
MW249	**01 Oct 2020**	0.15	22.2	-154.2	1,365	7.3
MW249	**15 Dec 2020**	0.9	22.8	-72.4	1,098	7.33
MW249	**16 Feb 2021**	0.29	22.5	-149.1	1,268	7.27
MW249	**15 Mar 2021**	6.2	22.6	-197.2	1,305	7.5
MW249	**09 Jun 2021**	0.94	19.2		1,243	7.32
MW249	**31 Aug 2021**	2.56	19.9	82.6	1,303	7.67
MW249	**12 Jan 2022**	2.09	25.2	-24.2	1,256	7.43
MW249	**17 Mar 2022**	0.92	22.5	-178.8	1,175	7.47
MW249	**08 Jun 2022**	0.77	21.6	-149.6	1,239	7.49
MW249	**06 Sep 2022**	2.88	18.7	48.5	1,209	7.42
MW249	**13 Dec 2022**	1.77	19.6	64.1	1,199	7.57
MW249	**13 Mar 2023**	1.42	22.3	-94.6	1,298	7.41
MW249	**06 Jun 2023**	0.87	17.3	-146.9	1,312	7.38
MW249	**04 Sep 2023**	1.68	21.4	-30.8	1,396	7.43
MW255	**04 Aug 2017**	3.3	18.9	72	862	7.37
MW255	**16 Jul 2020**	2.76	19.9	769	1,086	7.69
MW255	**22 Sep 2020**	2.95	18.8	75	932	7.37
MW255	**16 Dec 2020**	3.72	23	-17.5	662	0.34
MW255	**17 Mar 2021**	0.96	24.3	-80	1,847	7.64
MW255	**10 Jun 2021**	0.99	20.3		968	7.89
MW255	**31 Aug 2021**	2.21	20.2	-31.7	928	7.45
MW255	**16 Nov 2021**	2.21	20.2	-31.7	928	7.45
MW255	**10 Jan 2022**	0.84	22	70.4	786	7.62
MW255	**17 Mar 2022**	0.85	22.8	-173.5	808	7.72
MW255	**09 Jun 2022**	1.37	19.6	-70.8	816	7.74
MW255	**06 Sep 2022**	1.04	18.4	-58.7	878	7.56
MW255	**13 Dec 2022**	1.39	19.5	75.4	929	7.73
MW255	**13 Mar 2023**	1.5	21.8	90.5	844	7.58
MW255	**06 Jun 2023**	0.79	18.3	-155.5	794	7.55
MW255	**14 Jul 2023**		19.9	89.2	905	7.4
MW255	**05 Sep 2023**	1.74	20.2	128.9	866	7.46
MW256	**04 Aug 2017**	3.03	18.3	41	591	7.29
MW256	**30 Mar 2020**	1.06	20.7		2,443	7.71
MW256	**16 Jul 2020**	1.75	19.1	-52.3	1,197	7.49
MW256	**22 Sep 2020**	1.95	17.9	86.2	868	7.19
MW256	**14 Dec 2020**	2.17	20.5	82.9	1,203	7.25
MW256	**17 Mar 2021**	1.24	21.9	-116.6	1,955	7.33
MW256	**10 Jun 2021**	0.9	20		1,471	7.02
MW256	**31 Aug 2021**	1.86	19.7	-175.5	1,477	7.37
MW256	**16 Nov 2021**	1.86	19.7	-175.5	1,477	7.37
MW256	**10 Jan 2022**	0.83	22.2	49.9	1,610	7.03
MW256	**17 Mar 2022**	0.72	21	-248.2	3,737	7.2
MW256	**09 Jun 2022**	1.19	18.9	-179.8	1,261	7.25
MW256	**06 Sep 2022**	0.7	17.8	-190.7	1,858	7.13
MW256	**13 Dec 2022**	0.8	19.6	79.3	1,683	7.33
MW256	**13 Mar 2023**	1.95	21.1	107.2	1,664	7.12
MW256	**06 Jun 2023**	0.71	16.2	-222.6	1,621	7.12
MW256	**05 Sep 2023**	3.02	20.1	132	1,273	7.2

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW257	**04 Aug 2017**	8	18.3	96	373	7.69
MW257	**19 Dec 2019**	5.32	19.8		473.3	7.91
MW257	**02 Apr 2020**	5.69	21.8		539	7.66
MW257	**16 Jul 2020**	6.56	18.8	10	335.4	8.27
MW257	**22 Sep 2020**	6.33	18.5	76.3	365.8	7.96
MW257	**16 Dec 2020**	5.24	23.3	18.5	3,116	7.8
MW257	**18 Mar 2021**	5.14	22.2	74.9	579	7.78
MW257	**09 Jun 2021**	5.5	17.8		491	8.15
MW257	**31 Aug 2021**	6.51	18.8	56.8	328.8	8.19
MW257	**16 Nov 2021**	6.51	18.8	56.8	328.8	8.19
MW257	**10 Jan 2022**	4.81	21.4	74.3	565	7.81
MW257	**17 Mar 2022**	1.96	22.1	-48	521	7.77
MW257	**09 Jun 2022**	6.22	19.3	-18.6	358.2	8.08
MW257	**06 Sep 2022**	6.87	17.7	-1.4	357	8.25
MW257	**13 Dec 2022**	5.07	19.8	74.1	546.7	8.02
MW257	**13 Mar 2023**	4.75	23.4	118.4	569	7.79
MW257	**06 Jun 2023**	5.83	18.4	-111.1	373.2	7.89
MW257	**14 Jul 2023**	7.59	20	67.6	264.4	8.22
MW257	**05 Sep 2023**	7.15	20.2	116.5	321.6	8.1
MW258	**04 Aug 2017**	0.24	20.6	92	931	7.28
MW258	**08 Jun 2022**	3.21	20.5	110.5		7.84
MW258	**06 Sep 2022**	1.7	19.2	31.8	1,153	7.36
MW258	**13 Dec 2022**	1.83	20.7	87.2	1,360	7.45
MW258	**13 Mar 2023**	2.58	22.7	41.7	1,364	7.1
MW258	**06 Jun 2023**	2.1	19.7	-137.3	1,799	7.12
MW258	**14 Jul 2023**	1.29	21.1	62.6	1,619	7.26
MW258	**05 Sep 2023**	2.73	21.1	143.6	1,627	7.39
MW259	**04 Aug 2017**	0.076	17.8	53	444	7.38
MW259	**16 Jul 2020**	3.28	19.4	13.1	432.5	7.84
MW259	**22 Sep 2020**	3.82	18.5	94.9	529	7.48
MW259	**16 Dec 2020**	1.97	21.3	38.7	3,068	7.37
MW259	**18 Mar 2021**	2.66	21.3	76.4	36,564	7.42
MW259	**10 Jun 2021**	2.79	19.7		715	8.13
MW259	**31 Aug 2021**	3.82	18.2	85.8	533.5	7.39
MW259	**16 Nov 2021**	3.82	18.2	85.8	533.5	7.39
MW259	**11 Jan 2022**	2.31	22.8	44.3	1,503	7.76
MW259	**17 Mar 2022**	2.36	20.7	-76.6	638	7.83
MW259	**09 Jun 2022**	2.64	18	3.3	389.3	7.91
MW259	**06 Sep 2022**	2.95	17.6	129.1	482.6	7.54
MW259	**13 Dec 2022**	2.81	18.7	75.1	536	7.7
MW259	**13 Mar 2023**	2.11	21.9	80.9	494	7.23
MW259	**06 Jun 2023**	2.96	16.7	-135	547	7.59
MW259	**05 Sep 2023**	2.06	19.7	96.6	992	7.28
MW268	**01 Aug 2017**	0.13	19.5	-112	7,750	7.3
MW268	**12 Nov 2019**	0.09	21.9		4,672	7.15
MW268	**19 Dec 2019**	3.85	19.3		4,279	7.07
MW268	**30 Mar 2020**	1.87	22.2		5,341	7.35
MW268	**21 Jul 2020**	3.46	20.4	-48.8	90.4	7.33
MW268	**21 Sep 2020**	2.78	19.8	72.3	8,611	7.37
MW268	**14 Dec 2020**	1.22	21.7	105	8,601	7.31
MW268	**16 Mar 2021**	0.76	22.4	58	9,295	7.35
MW268	**09 Jun 2021**	1.1	18.2		10,486	7.21
MW268	**31 Aug 2021**	1.87	22.3	74.9	6,717	7.28
MW268	**11 Nov 2021**	1.09	22.6	-87.2	5,528	7.33
MW268	**16 Nov 2021**	1.87	22.3	74.9	6,717	7.28
MW268	**11 Jan 2022**	1.49	23.6	65.3	4,495	7.27
MW268	**17 Mar 2022**	1.29	22.9	64.2	5,494	7.26
MW268	**09 Jun 2022**	1.06	20.9	-9.2	4,018	7.3
MW268	**06 Sep 2022**	1.97	18.2	-44.1	5,842	7.25
MW268	**13 Dec 2022**	0.87	20.2	-7.9	10,265	7.21
MW268	**15 Mar 2023**	1.93	23.2	48.4	5,919	7.19
MW268	**06 Jun 2023**	2.17	18.3	-164.5	7,794	7.32
MW268	**04 Sep 2023**	1.1	20.7	-22.8	14,105	7.26
MW269	**01 Aug 2017**	0.48	19.3	-161	1,361	7.32
MW269	**12 Nov 2019**	0.46	21.2		962	7.51
MW269	**19 Dec 2019**	1.56	19.1		827	7.55
MW269	**30 Mar 2020**	1.23	21.9		1,408	7.59
MW269	**21 Jul 2020**	7.16	20.3	-136.1	1,837	7.7
MW269	**21 Sep 2020**	2.16	19.8	-137.3	1,624	7.6
MW269	**14 Dec 2020**	2.91	21.5	-31.2	1,927	7.67
MW269	**16 Mar 2021**	0.84	22.7	-230.5	2,366	7.69
MW269	**09 Jun 2021**	2.07	17.9		2,223	7.52
MW269	**31 Aug 2021**	1.61	21.4	-57.2	1,775	7.41
MW269	**16 Nov 2021**	1.61	21.4	-57.2	1,775	7.41
MW269	**11 Jan 2022**	1.39	24.2	54.1	1,738	7.35
MW269	**17 Mar 2022**	1.64	22.1	-224.2	1,700	7.46
MW269	**09 Jun 2022**	1.52	19	-109.9	1,715	7.32
MW269	**06 Sep 2022**	1.5	18.5	-10.8	1,578	7.52
MW269	**13 Dec 2022**	1.1	19.7	24.4	1,181	7.6
MW269	**15 Mar 2023**	1.37	22.5	-127.1	1,744	7.41
MW269	**06 Jun 2023**	1.09	17.3	-194.1	1,717	7.58
MW269	**04 Sep 2023**	1.44	20.4	-143.2	2,071	7.62
MW282	**18 Dec 2019**	5.08	23.4		222.1	6.96
MW282	**31 Mar 2020**	3.55	21.5		1,374	6.77
MW282	**22 Jul 2020**	5.12	21.7	18.8	1,111	7.22
MW282	**24 Sep 2020**	8.14	17.7	101	861	7.73
MW282	**15 Dec 2020**	1.82	22.7	3.2	1,198	6.96
MW282	**18 Mar 2021**	0.97	23	12.9	1,520	7.11
MW282	**09 Jun 2021**	2.37	19.2		1,339	7.42
MW282	**31 Aug 2021**	1.95	20	-128.9	1,003	7.21
MW282	**16 Nov 2021**	1.95	20	-128.9	1,003	7.21
MW282	**13 Jan 2022**	2.42	21.3	84.1	1,056	7.03
MW282	**17 Mar 2022**	1.23	22.5	-60.5	1,179	7.09
MW282	**08 Jun 2022**		17.7	97.6		7.15
MW282	**08 Sep 2022**	3.05	16.8	2.1	774	7.17
MW282	**13 Dec 2022**	2.17	18.8	-17.3	933	7.09

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW282	**08 Jun 2023**	3.66	18.6	0.989	1,103	7.01
MW282	**14 Jul 2023**	4.04	20	37	990	7.3
MW288	**15 Jul 2020**	2.24	19.6	-19.9	1,209	7.48
MW288	**17 Mar 2021**	2.7	24.4	-177.5	1,415	7.65
MW288	**31 Aug 2021**	1.09	20.1	57.4	1,178	7.83
MW288	**12 Jan 2022**	1.28	26.2	38.8	885	7.56
MW288	**08 Jun 2022**	1.21	19.3	8.6		8.06
MW288	**06 Sep 2022**	2.55	18.6	-134	850	6.27
MW288	**12 Dec 2022**	1.47	22.7	-157.7	2,249	7.59
MW288	**14 Mar 2023**	0.88	23.7	-199.6	790	6.65
MW288	**05 Sep 2023**	1.91	20.7	-18.2	435.2	7.36
MW289	**30 Mar 2020**	1.6	22.1		1,212	7.58
MW289	**22 Jul 2020**	2.21	19.4	-5.7	996	7.6
MW289	**21 Sep 2020**	2.9	17.6	33.9	815	7.38
MW289	**15 Dec 2020**	0.59	22.8	-9.2	1,763	7.5
MW289	**16 Mar 2021**	1.3	24.1	27.3	1,322	7.82
MW289	**09 Jun 2021**	0.94	19.7		2,432	7.54
MW289	**30 Aug 2021**	2.18	19.2	205.7	1,064	7.68
MW289	**17 Mar 2022**	1.09	23.3	-84.7	1,296	7.34
MW289	**08 Jun 2022**	0.55	21.2	-36.3	1,206	7.52
MW289	**05 Sep 2022**	1.77	21.4	-239	1,837	7.92
MW289	**13 Dec 2022**	0.48	20.6	75.1	907	7.64
MW289	**14 Mar 2023**	0.86	24.2	-94.1	1,188	6.62
MW289	**06 Jun 2023**	2.87	18.7	-49.2	981	7.52
MW289	**04 Sep 2023**	1.09	21.8	-27.5	802	7.53
MW496	**14 Oct 2019**	0.2	20.9		1,547	7.2
MW496	**06 Sep 2022**	0.73	17.2	133.4	1,584	7.46
MW496	**14 Nov 2022**	0.89	20.4	-186.4	1,385	7.59
MW496	**13 Dec 2022**	0.86	19.9	76.6	1,394	7.7
MW496	**13 Mar 2023**	0.88	22	-216.6	1,485	7.54
MW496	**12 May 2023**	1.83	18.8	-199.7	1,531	7.36
MW496	**06 Jun 2023**	1.01	16.4	-202.7	1,577	7.5
MW496	**04 Sep 2023**	3.98	21.6	-52.3	1,207	7.26
MW500	**05 Nov 2019**	3.4	22.1		702	7.26
MW500	**15 Nov 2021**	1.5	22.4	-23	842	7.2
MW500	**10 Jan 2022**	1.3	23.1	-27.3	332.6	7.44
MW500	**14 Mar 2022**	0.85	24	72.7	921	7.04
MW500	**07 Jun 2022**	1.34	18.5	123.1	880	7.36
MW500	**05 Sep 2022**	1.12	20	65.3	699	7.42
MW500	**12 Dec 2022**	1.03	23.6	6.9	667	7.53
MW500	**13 Mar 2023**	1.5	22.7	113.1	997	7.19
MW500	**05 Sep 2023**	1.51	21.5	-1.2	814	7.32
MW516	**30 Mar 2020**	1.45	22.1		1,284	7.61
MW516	**21 Jul 2020**	8.47	21.6	8.89	3,296	7.27
MW516	**21 Sep 2020**	1.43	19.1	83.1	1,359	7.17
MW516	**07 Oct 2020**	0.28	22.6	-65.5	1,418	7.01
MW516	**16 Dec 2020**	1.14	22.8	5	1,455	7.15
MW516	**17 Feb 2021**	0.02	22.9	-154.4	1,466	7.03
MW516	**18 Mar 2021**	0.77	22.5	-136.2	1,504	7.14
MW516	**09 Jun 2021**	1.66	17.7		1,525	7.23
MW516	**31 Aug 2021**	0.87	23.6	72.8	2,246	7.12
MW516	**16 Nov 2021**	0.87	23.6	72.8	2,246	7.12
MW516	**12 Jan 2022**	1.27	23.8	-9.4	1,879	7.26
MW516	**17 Mar 2022**	0.88	22.2	-55.1	1,664	7.32
MW516	**08 Jun 2022**	0.73	20.2	-66.5	1,229	7.28
MW516	**06 Sep 2022**	0.68	18.5	50.6	2,044	7.3
MW516	**13 Dec 2022**	2.27	19.5	-62.7	1,250	7.6
MW516	**13 Mar 2023**	1.84	21.8	-88.3	1,082	7.3
MW516	**06 Jun 2023**	1.88	17.2	-164.8	644	7.35
MW516	**04 Sep 2023**	1.15	21	-48.7	1,192	7.16

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
PW304	**08 Jan 2020**	3.42	23.1	-95.9		7.64
PW304	**01 Apr 2020**	7.01	20.3	-26.7	24,093	8.26
PW304	**20 Jul 2020**	1.22	18.5	-71.1	14,406	
PW304	**22 Sep 2020**	0.79	17.9	-302.9	39,723	7.29
PW304	**15 Dec 2020**	0.51	27	-271.4	44,353	7.24
PW304	**15 Mar 2021**	1.17	20.8	2.9	48,004	7.32
PW304	**10 Jun 2021**	4.7	18.5	85.6	33,159	7.76
PW304	**01 Sep 2021**	2.62	16.6	43.4	51,304	7.65
PW304	**11 Jan 2022**	0.5	25.8	-299.4	60,090	7.43
PW304	**08 Jun 2022**	1.8	14.9	84.8		7.47
PW304	**05 Sep 2022**	1.54	20.1	-259.9	8,335	7.67
PW304	**12 Dec 2022**	0.8	22.9	-282	61,802	7.52
PW304	**13 Mar 2023**	1.72	28.3	-103.5	58,303	7.1
PW306	**31 Mar 2020**	1.72	23.7	-418.6	56,187	6.79
PW306	**22 Jul 2020**	7.65	17.3	23.3	18,326	
PW306	**23 Sep 2020**	19.39	16.1	76.2	55,838	7.84
PW306	**15 Dec 2020**	0.71	23.7	-228.6	55,732	7.47
PW306	**17 Mar 2021**	1.16	24.5	33.8	58,544	7.6
PW306	**09 Jun 2021**	4.23	15.9	55.7	54,619	7.95
PW306	**31 Aug 2021**	6.13	18	29.9	52,146	7.57
PW306	**13 Jan 2022**	0.97	25.9	44.3	55,478	7.74
PW306	**16 Mar 2022**	4.01	24.6	32	55,887	7.7
PW306	**07 Jun 2022**	0.69	14.8	-244.1		7.3
PW306	**06 Sep 2022**	6.78	17.8	20	42,474	8.13
PW306	**13 Dec 2022**	2.12	19.4	-142.9	61,177	7.69
PW306	**14 Mar 2023**	2.48	23.8	82.4	56,851	7.88
PW306	**08 Jun 2023**	4.32	16	54.5	53,040	7.55
PW306	**04 Sep 2023**	4.32	16	54.5	53,040	7.55
PW307	**31 Mar 2020**	1.82	25.1	-418.5	54,463	7.07
PW307	**22 Jul 2020**		17.2	23	18,913	
PW307	**23 Sep 2020**	3.72	19.6	84.7	56,666	8.02
PW307	**15 Dec 2020**	2.5	22.8	69.1	55,544	7.73
PW307	**17 Mar 2021**	3.87	23.8	65.9	58,544	8
PW307	**09 Jun 2021**	4.86	15.5	45.7	54,395	8.07
PW307	**31 Aug 2021**	5.36	17.6	-119.8	53,079	8.04
PW307	**13 Jan 2022**	1.09	25.3	57	56,400	7.91
PW307	**16 Mar 2022**	3.59	24.2	59.9	55,319	7.82
PW307	**07 Jun 2022**	2.11	15	100.7		8
PW307	**06 Sep 2022**	6.42	17.5	64.3	41,877	7.96
PW307	**13 Dec 2022**	1.2	19.7	-0.8	65,633	7.82
PW307	**14 Mar 2023**	4.14	24	84	56,870	7.59
PW307	**08 Jun 2023**	4.87	15.8	54.8	53,400	7.55
PW307	**04 Sep 2023**	4.87	15.8	54.8	53,400	7.55
PW308	**01 Apr 2020**	5.61	23.2	-12.4	51,183	8.16
PW308	**22 Jul 2020**	7.55	17.1	12.3	18,584	
PW308	**23 Sep 2020**	7.67	17.5	81	47,667	8.15
PW308	**15 Dec 2020**	3.33	23.4	625	55,712	7.88
PW308	**17 Mar 2021**	3.2	25.2	63.7	57,750	7.92
PW308	**09 Jun 2021**	4.82	16.5	-9.1	53,704	8.05
PW308	**31 Aug 2021**	7.64	20.6	72.7	51,369	8.11
PW308	**13 Jan 2022**	1.08	26.2	55.4	56,087	8.04
PW308	**16 Mar 2022**	4.43	24.2	49	28,413	8.04
PW308	**07 Jun 2022**	3.08	14.7	79.1		7.97
PW308	**06 Sep 2022**	6.63	18.2	10.1	42,881	8.04
PW308	**13 Dec 2022**	3.13	19.6	15.1	63,916	7.83
PW308	**14 Mar 2023**	4.48	24	78	56,713	7.94
PW308	**08 Jun 2023**	4.58	16	48	54,204	7.55
PW308	**04 Sep 2023**	4.58	16	48	54,204	7.55
PW314	**31 Mar 2020**	1.94	22.7	-404.3	50,749	7.01
PW314	**22 Jul 2020**	6.09	18.1	15.9	18,920	
PW314	**23 Sep 2020**	1.28	17.8	74.6	56,902	7.91
PW314	**15 Dec 2020**	1.56	25.7	-312.9		7.01
PW314	**17 Mar 2021**	3.11	24.3	59.9	60,103	7.66
PW314	**09 Jun 2021**	4.12	15.5	42.8	54,449	7.96
PW314	**31 Aug 2021**	4.46	18	-127.4	53,616	7.9
PW314	**13 Jan 2022**	0.92	24.7	47.1	56,016	7.8
PW314	**16 Mar 2022**	1.68	24.8	41.7	56,206	7.55
PW314	**07 Jun 2022**	1.25	15.8	85.4		7.61
PW314	**06 Sep 2022**	5.83	17.8		42,404.27	41.4
PW314	**13 Dec 2022**	2.63	20.3	-66.7	64,969	7.72
PW314	**14 Mar 2023**	3.79	23.9	84.4	57,136	7.51
PW314	**08 Jun 2023**	4.2	15.9	58.2	53,028	7.55
PW314	**04 Sep 2023**	4.2	15.9	58.2	53,028	7.55
PW315	**01 Apr 2020**	5.99	24.2	-19.8	51,079	8.23
PW315	**22 Jul 2020**	5.71	16.6	16.5	18,647	
PW315	**23 Sep 2020**	5.14	16.6	82.5	46,745	7.91
PW315	**15 Dec 2020**	0.83	23.9	-250.1	56,808	6.71
PW315	**17 Mar 2021**	3.54	25.1	66.9	57,309	7.89
PW315	**09 Jun 2021**	4.76	15.2	31.1	54,490	8.05
PW315	**31 Aug 2021**	10.97	18.2	80	1,765	7.94
PW315	**13 Jan 2022**	1.31	25.5	59.9	56,137	7.94
PW315	**16 Mar 2022**	3.73	24.5	57.1	56,140	7.66
PW315	**07 Jun 2022**	1.38	15.5	97.7		7.7
PW315	**06 Sep 2022**	6.46	17.2	20.7	38,278	8.13
PW315	**13 Dec 2022**	2.77	19.8	-38.8	64,981	7.76
PW315	**14 Mar 2023**	3.18	23.9	84.5	57,129	7.51
PW315	**08 Jun 2023**	4.1	16	50.3	53,040	7.5
PW315	**04 Sep 2023**	4.1	16	50.3	53,040	7.5
PW316	**01 Apr 2020**	0.03	22.4	-410.8	58,295	7.43
PW316	**22 Jul 2020**	7.3	17.6	9.6	18,730	
PW316	**23 Sep 2020**	10.81	16.8	83.5	47,057	8.02
PW316	**15 Dec 2020**	3.22	23.4	747	56,627	7.84
PW316	**17 Mar 2021**	3.33	26.6	63	60,123	7.96
PW316	**09 Jun 2021**	5.21	15.4	33.8	54,614	8.08
PW316	**31 Aug 2021**	5.27	17.4	-157.9	53,034	8.01

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
PW316	**13 Jan 2022**	1.33	24.5	60.7	55,679	8
PW316	**16 Mar 2022**	4.21	24.5	-37.3	56,064	7.87
PW316	**07 Jun 2022**	2.43	15.3	88.8		7.96
PW316	**06 Sep 2022**	6.65	17.8	20.8	42,533	8.12
PW316	**13 Dec 2022**	2.75	20.4	19.2	65,154	7.82
PW316	**14 Mar 2023**	3.38	24	84.5	53,657	8.12
PW316	**08 Jun 2023**	4.51	16	60.1	54,008	7.49
PW316	**04 Sep 2023**	4.51	16	60.1	54,008	7.49
PW329	**09 Jan 2020**	2.08	24.5	196.4	67,738	7.45
PW329	**30 Mar 2020**	1.72	22	-418.6	56,187	6.79
PW329	**20 Jul 2020**	9.23	15	14.4	18,249	
PW329	**23 Sep 2020**	2.52	14.7	123.1	45,149	7.72
PW329	**14 Dec 2020**	1.09	22	-69.7	54,407	7.61
PW329	**16 Mar 2021**	2.36	23.1	121	57,859	7.57
PW329	**08 Jun 2021**	1.22	15.1	-84.4	53,614	7.59
PW329	**30 Aug 2021**	1.98	14.9	-12.6	52,022	7.95
PW329	**10 Jan 2022**	0.11	24.9	-280.4	63,330	7.45
PW329	**15 Mar 2022**	1.49	26.2	-2.3	57,145	7.73
PW329	**08 Jun 2022**	3.49	16.4	4.7	54,744	7.49
PW329	**05 Sep 2022**	1.1	15.9	-146.4	54,958	7.76
PW329	**12 Dec 2022**	0.58	23	-251.1	59,412	7.69
PW329	**15 Mar 2023**	3.04	24.5	-3	51,388	7
PW329	**07 Jun 2023**	2.05	21.4	66.4	54,205	7.33
PW329	**11 Sep 2023**	2.05	21.4	66.4	54,205	7.33
PW330	**09 Jan 2020**	2.17	24.3	-188.5	69,074	7.25
PW330	**30 Mar 2020**	1.82	22	-418.5	54,463	7.07
PW330	**20 Jul 2020**	6.18	15.1	15.5	18,514	
PW330	**22 Sep 2020**	1.88	19	35.6	55,768	7.75
PW330	**14 Dec 2020**	1.08	22.6	-94.2	54,711	7.67
PW330	**16 Mar 2021**	0.81	24	-50.5	57,538	7.67
PW330	**08 Jun 2021**	2.87	14.8	155.5	53,016	7.21
PW330	**30 Aug 2021**	4.67	15.4	41.9	52,755	7.78
PW330	**10 Jan 2022**	0.8	23.5	-155.5	62,077	7.64
PW330	**15 Mar 2022**	1.83	25.5	13.1	57,452	7.86
PW330	**08 Jun 2022**	1.54	14.9	-67.8	55,396	7.12
PW330	**05 Sep 2022**	0.88	15.9	-48.8	56,245	7.73
PW330	**12 Dec 2022**	0.48	23.1	-259.7	57,250	7.65
PW330	**15 Mar 2023**	3.17	25.1	-4.1	51,730	7.2
PW330	**07 Jun 2023**	4.54	16.4	72	52,412	7.78
PW330	**11 Sep 2023**	4.54	16.4	72	52,412	7.78
PW331	**09 Jan 2020**	4.99	25.7	-136.1	32,835	7.48
PW331	**30 Mar 2020**	1.94	22.2	-404.3	50,749	7.01
PW331	**20 Jul 2020**	6.52	15.7	14.7	18,665	
PW331	**23 Sep 2020**	1.556	17.2	-8.3	56,304	7.8
PW331	**14 Dec 2020**	1.33	21.2	-78.6	55,666	7.61
PW331	**16 Mar 2021**	16	24.9	-99.8	58,310	7.59
PW331	**08 Jun 2021**	2.18	15.8	94.9	54,740	6.68
PW331	**30 Aug 2021**	6.15	16.9	22.8	51,797	8.03
PW331	**10 Jan 2022**	0.48	23.3	-151.7	60,610	7.61
PW331	**15 Mar 2022**	0.91	25.5	58.4	58,760	7.59
PW331	**08 Jun 2022**	2.63	14.9	2.3	55,637	7.43
PW331	**05 Sep 2022**	2.74	16.9	-17.8	53,876	7.8
PW331	**12 Dec 2022**	1.08	22.3	-272.5	57,821	7.56
PW331	**15 Mar 2023**	1.22	22.9	-209.5	49,518	6.66
PW331	**07 Jun 2023**	1.97	21.7	63.4	54,701	7.32
PW331	**11 Sep 2023**	1.97	21.7	63.4	54,701	7.32
PW335	**30 Mar 2020**	29.1	21	-56.8	50,171	7.39
PW335	**15 Jul 2020**	6.94	13.5	253.1	40,653	7.19
PW335	**22 Sep 2020**	1.23	17.7	-288	55,023	7.65
PW335	**14 Dec 2020**	0.53	21.9	-248.8	52,709	7.48
PW335	**15 Mar 2021**	2.09	20.3	-188.4	53,257	7.48
PW335	**08 Jun 2021**	0.69	14.6	-219.2	53,928	7.58
PW335	**30 Aug 2021**	3.57	15.8	-148.6	52,830	7.8
PW335	**10 Jan 2022**	1.48	22	-159.6	52,616	7.82
PW335	**14 Mar 2022**	4.15	23	60.5	54,374	8.06
PW335	**07 Jun 2022**	2.01	14.4	-46.9	54,988	7.58
PW335	**05 Sep 2022**	0.91	15.9	-119.5	44,876	7.54
PW335	**12 Dec 2022**	0.77	20.5	-292.4	48,299	7.64
PW335	**13 Mar 2023**	1.27	22.8	-154.3	33,435	6.93
PW335	**07 Jun 2023**	5.67	15.3	24	48,516	7.68
PW335	**05 Sep 2023**	5.67	15.3	24	48,516	7.68
PW340	**30 Mar 2020**	1.76	20.5	-61	42,669	7.3
PW340	**15 Jul 2020**	5.92	13.9	179.8	42,386	7.54
PW340	**22 Sep 2020**	1.04	18.8	-91.1	56,070	7.81
PW340	**14 Dec 2020**	0.27	20.8	-213.3	56,509	7.5
PW340	**15 Mar 2021**	1.59	21.1	78.4	62,031	7.51
PW340	**08 Jun 2021**	1.3	14.5	-185.2	52,583	7.98
PW340	**30 Aug 2021**	1.91	15.9	-145.1	51,746	7.72
PW340	**10 Jan 2022**	1.47	22.5	192.5	52,319	7.87
PW340	**14 Mar 2022**	0.67	25.8	-117.9	58,496	7.58
PW340	**07 Jun 2022**	1.36	14.8	-86.6	55,300	7.52
PW340	**05 Sep 2022**	1.96	15.2	-156.3	25,584	7.66
PW340	**12 Dec 2022**	0.67	22.8	-300.1	54,245	7.51
PW340	**13 Mar 2023**	0.08	24.1	-327.7	58,274	6.69
PW340	**07 Jun 2023**	1.64	15	-36.1	48,214	7.7
PW340	**05 Sep 2023**	1.64	15	-36.1	48,214	7.7
PW341	**08 Jan 2020**	5.02	23.1	135.6	57,353	7.64
PW341	**31 Mar 2020**	29.1	20.6	-56.8	50,171	7.39
PW341	**15 Jul 2020**	5.35	14.2	-50	41,354	7.24
PW341	**22 Sep 2020**	1.82	19.2	-61.4	56,627	7.91
PW341	**14 Dec 2020**	0.85	21.7	-76.5	56,361	6.99
PW341	**15 Mar 2021**	1.35	21.7	-26.4	53,674	7.55
PW341	**08 Jun 2021**	1.46	13.9	-154.2	54,796	7.92
PW341	**30 Aug 2021**	2.42	16	-175.3	50,897	7.76
PW341	**10 Jan 2022**	0.55	22.3	-199.4	56,536	7.81
PW341	**14 Mar 2022**	1.16	26.4	-169.4	59,392	7.68
PW341	**07 Jun 2022**	1.47	14.7		54,044	7.59

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
PW341	**05 Sep 2022**	0.93	18.6	-205.7	48,981	7.79
PW341	**12 Dec 2022**	0.29	22.5	-287.9	52,021	7.63
PW341	**13 Mar 2023**	3	26.5	-91.3	53,937	7.26
PW341	**07 Jun 2023**	4.87	15.7	-42.7	47,646	7.77
PW341	**05 Sep 2023**	4.87	15.7	-42.7	47,646	7.77
PW345	**31 Mar 2020**	1.76	21	-61	42,669	7.3
PW345	**24 Sep 2020**	0.75	18.5	-205.2	57,105	7.35
PW345	**15 Dec 2020**	0.56	24.5	-303.4	60,970	6.93
PW345	**16 Mar 2021**	1.31	25.7	-13.8	53,528	7.08
PW345	**09 Jun 2021**	6.59	15.6	107.2	51,954	7.98
PW345	**01 Sep 2021**	1.34	15.7	-214.3	41,671	6.99
PW345	**10 Jan 2022**	0.31	24.7	-328.9	58,841	7.08
PW345	**14 Mar 2022**	0.92	25.7	-42	59,113	7.48
PW345	**07 Jun 2022**	12.53	14.2	89.6	44,314	7.72
PW345	**05 Sep 2022**	5.16	17.8	86.6	41,294	7.89
PW345	**13 Dec 2022**	0.8	18.7	-252.9	49,006	7.59
PW345	**14 Mar 2023**	0.81	23.4	-88.9	64,413	7.44
PW345	**07 Jun 2023**	4.96	15.5	102.8	48,591	7.66
PW345	**05 Sep 2023**	4.96	15.5	102.8	48,591	7.66
PW346	**08 Jan 2020**	48.3	24.6	-262	20,522	7.36
PW346	**01 Apr 2020**	4.82	23.9	-410.8	55,889	7.74
PW346	**15 Jul 2020**	4.27	16	76.8	20,001	8.14
PW346	**22 Sep 2020**	1.84	20.8	-189.9	30,121	7.5
PW346	**15 Dec 2020**	0.3	23.3	-224.8	18,731	7.61
PW346	**17 Mar 2021**	0.37	30.5	19.5	46,731	6.96
PW346	**10 Jun 2021**	0.83	19.3	34.9	51,243	8.13
PW346	**30 Aug 2021**	2.81	17.1	-194.7	50,379	7.65
PW346	**12 Jan 2022**	0.63	25.1	-272.4	50,919	7.46
PW346	**08 Jun 2022**	0.05	15.4	14.1		7.5
PW346	**06 Sep 2022**	2.98	14.2	9.9	42,328	7.31
PW346	**12 Dec 2022**	5.5	28.8	-60.7	59,176	8.05
PW346	**14 Mar 2023**	0.1	26.8	-348.3	60,160	6.57
PW350	**21 Jul 2020**	6.8	16.5	23.1	18,303	
PW350	**23 Sep 2020**	6.23	17.5	84.8	56,574	8.12
PW350	**16 Dec 2020**	1.52	22.5	61.9	57,539	7.62
PW350	**17 Mar 2021**	3.87	23.8	98.8	58,595	7.53
PW350	**08 Jun 2021**	4.05	19.1	-8.8	55,302	8.06
PW350	**30 Aug 2021**	6	17.2	86.1	52,311	8.05
PW350	**11 Jan 2022**	3.21	25.2	64.6	55,250	7.89
PW350	**14 Mar 2022**	4.62	26	67	56,464	7.92
PW350	**07 Jun 2022**	13.69	17.8	8.6	48,194	7.88
PW350	**07 Sep 2022**	6.71	15.2	116.2	47,882	8.11
PW350	**12 Dec 2022**	1.85	23.5	49.6	57,304	7.84
PW350	**07 Jun 2023**	4.12	18	74.3	54,119	8.01
PW350	**05 Sep 2023**	4.12	18	74.3	54,119	8.01
PW351	**02 Apr 2020**	9.25	22.7	152.7	56,049	8.08
PW351	**21 Jul 2020**	83.53	17	19	18,736	
PW351	**24 Sep 2020**	6.66	17.6	75.5	56,307	8.28
PW351	**16 Dec 2020**	4.1	23.5	60.3	55,060	7.91
PW351	**17 Mar 2021**	3.19	23.4	111.2	56,494	7.7
PW351	**08 Jun 2021**	5.19	17.8	53.4	54,474	8.1
PW351	**30 Aug 2021**	5.94	17.1	66.8	52,547	8.12
PW351	**11 Jan 2022**	2.74	23.7	57.8	55,615	8.04
PW351	**14 Mar 2022**	3.26	26.9	61.9	56,513	7.84
PW351	**07 Jun 2022**	8.56	17.4	42.2	47,550	7.92
PW351	**07 Sep 2022**	7.5	15.8	110.2	28,328	8.15
PW351	**12 Dec 2022**	1.11	22.6	43.4	57,357	8
PW351	**16 Mar 2023**	5.22	23	78.8	55,097	8.01
PW351	**07 Jun 2023**	4.91	18.5	86.2	53,941	8.07
PW351	**05 Sep 2023**	4.91	18.5	86.2	53,941	8.07
PW352	**02 Apr 2020**	4.93	22.6	148.2	52,997	8.08
PW352	**21 Jul 2020**	7.11	17.3	10.7	18,624	
PW352	**24 Sep 2020**	5.48	18.1	59.5	56,425	8.16
PW352	**16 Dec 2020**	5	21.3	91.3	54,903	7.39
PW352	**17 Mar 2021**	4.34	24	73.1	56,595	7.91
PW352	**08 Jun 2021**	5.76	16.9	38.8	54,512	8.09
PW352	**30 Aug 2021**	5.42	18.4	98.3	52,492	8.12
PW352	**11 Jan 2022**	2.4	23.2	50.5	56,068	8.08
PW352	**14 Mar 2022**	4.06	25.9	61.8	31,412	7.95
PW352	**07 Jun 2022**	5.09	17.4	-77.8	47,701	7.83
PW352	**07 Sep 2022**	7.85	17.6	108.7	46,413	8.16
PW352	**12 Dec 2022**	2.63	23	44.8	56,950	8.01
PW352	**16 Mar 2023**	4.54	25.1	79.2	55,813	7.97
PW352	**07 Jun 2023**	4.1	18.2	74.2	53,471	8.05
PW352	**05 Sep 2023**	4.1	18.2	74.2	53,471	8.05
PW356	**09 Jan 2020**	6.05	23.5	-259.1	60,462	6.86
PW356	**30 Mar 2020**	1.42	21.3	-389.9	61,435	6.82
PW356	**20 Jul 2020**	5.3	15.8	15	18,666	
PW356	**23 Sep 2020**	1	17.5	-62	55,640	7.55
PW356	**14 Dec 2020**	1.08	20.5	-33.6	54,535	7.37
PW356	**16 Mar 2021**	2.52	24.4	-29.2	58,190	7.43
PW356	**08 Jun 2021**	1.43	15.3	-89.8	55,052	7.79
PW356	**30 Aug 2021**	2.82	15.9	-68.1	52,187	7.8
PW356	**10 Jan 2022**	0.82	23.5	-134.7	61,565	7.57
PW356	**15 Mar 2022**	1.44	24.9	70.8	58,725	7.42
PW356	**08 Jun 2022**	3.63	14.7	-18.2	54,998	7.48
PW356	**05 Sep 2022**	5.42	15.8	58.8	54,010	8.08
PW356	**12 Dec 2022**	0.9	21.8	-233.5	55,773	7.53
PW356	**15 Mar 2023**	1.24	22.1	-232	46,165	6.35
PW356	**07 Jun 2023**	2.08	21.8	69.2	53,470	7.34
PW356	**11 Sep 2023**	2.08	21.8	69.2	53,470	7.34
PW357	**09 Jan 2020**	6.51	23.8	121.8	64,613	7.53
PW357	**30 Mar 2020**	3.24	22.4	-416.7	54,056	7.13
PW357	**20 Jul 2020**	6.87	14.6	16.2	18,404	
PW357	**23 Sep 2020**	2.73	17.7	13.7	56,372	7.87
PW357	**14 Dec 2020**	1.44	21.2	-89.2	54,899	7.67
PW357	**16 Mar 2021**	0.67	24.6	-117	58,069	7.64

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	Date					
PW357	08 Jun 2021	1.85	15.6	70.5	54,595	7.71
PW357	30 Aug 2021	2.09	15.5	40.3	52,365	7.88
PW357	10 Jan 2022	0.71	23.5	-131.1	60,931	7.62
PW357	15 Mar 2022	1.05	26.3	52.3	58,198	7.68
PW357	08 Jun 2022	0.75	14.5	-280.9	55,126	7.32
PW357	05 Sep 2022	0.7	16.6	-111.8	55,272	7.74
PW357	12 Dec 2022	0.89	22.1	-214.5	56,962	7.56
PW357	15 Mar 2023	3.03	25.1	-25.9	52,087	7.04
PW357	07 Jun 2023	4.81	16.3	70.6	52,530	7.76
PW357	11 Sep 2023	4.81	16.3	70.6	52,530	7.76
PW358	09 Jan 2020	4.28	24.4	-94	58,439	7.63
PW358	30 Mar 2020	1.97	22.1	-418.7	58,689	6.93
PW358	20 Jul 2020	7.01	14.6	14.9	18,115	
PW358	23 Sep 2020	3.88	15.5	109	45,541	7.82
PW358	14 Dec 2020	1.45	23.6	-59	54,471	7.63
PW358	16 Mar 2021	1.33	23.2	69.9	57,869	7.71
PW358	08 Jun 2021	2.68	14.6	150.6	56,302	7.86
PW358	30 Aug 2021	2.28	16.1	3.7	52,348	7.86
PW358	10 Jan 2022	0.55	24.1	-211.7	62,130	7.68
PW358	15 Mar 2022	0.65	26.9	-172.6	56,858	7.55
PW358	08 Jun 2022	4.43	16.5	-8.1	54,480	7.6
PW358	05 Sep 2022	1.12	15.9	-193.4	55,426	7.38
PW358	12 Dec 2022	1.11	23.9	-270	58,987	7.65
PW358	15 Mar 2023	2.97	24.2	-60.5	51,274	7
PW358	07 Jun 2023	4.37	19.6	73.6	52,294	7.78
PW358	11 Sep 2023	4.37	19.6	73.6	52,294	7.78
PW362	31 Mar 2020	1.42	23.5	-389.9	61,435	6.82
PW362	15 Jul 2020	4.22	14.5	178.3	43,408	7.61
PW362	22 Sep 2020	1.88	18.7	-33.9	56,809	7.87
PW362	14 Dec 2020	0.61	22.6	-141.6	57,404	7.43
PW362	15 Mar 2021	0.72	23.9	-179.6	57,350	7.51
PW362	08 Jun 2021	0.96	14.6	-163	53,285	8.04
PW362	30 Aug 2021	1.92	15.8	-148	52,304	7.81
PW362	10 Jan 2022	1.05	22.7	-199.2	58,489	7.67
PW362	14 Mar 2022	1.4	27.4	-40.7	60,526	7.64
PW362	07 Jun 2022	1.34	14.4	-108.3	54,642	7.52
PW362	05 Sep 2022	1.42	18.9	-90.3	48,174	7.64
PW362	12 Dec 2022	0.54	23.2	-297.9	49,892	7.55
PW362	13 Mar 2023	0.73	25	-178.2	60,043	6.69
PW362	07 Jun 2023	1.7	14.9	-30.1	48,227	7.7
PW362	05 Sep 2023	1.7	14.9	-30.1	48,227	7.7
PW363	08 Jan 2020	3.05	23.8	-129	69,188	7.11
PW363	31 Mar 2020	3.24	21.5	-416.7	54,056	7.13
PW363	15 Jul 2020	2.81	13.9	-92.7	41,182	7.48
PW363	22 Sep 2020	1.38	19.9	-123.5	55,586	7.91
PW363	14 Dec 2020	4.51	21.3	92	24,009	7.55
PW363	15 Mar 2021	1.37	21.4	-97.9	52,385	7.5
PW363	08 Jun 2021	1.26	14.3	-192.7	54,079	7.8
PW363	30 Aug 2021	1.71	15.7	-159.3	50,818	7.76
PW363	10 Jan 2022	0.77	21.5	-200.2	56,876	7.77
PW363	14 Mar 2022	0.68	25.9	-121.3	58,150	7.56
PW363	07 Jun 2022	5.41	14.5	-42	54,361	7.9
PW363	05 Sep 2022	1.15	17.7	-259.7	47,879	7.8
PW363	12 Dec 2022	0.38	22.4	-311	52,027	7.67
PW363	13 Mar 2023	0.97	24.8	-230.7	58,173	6.83
PW363	07 Jun 2023	4.55	16.2	-119.3	52,841	7.95
PW363	05 Sep 2023	4.55	16.2	-119.3	52,841	7.95
PW364	30 Mar 2020	2.65	21.5	67.5	43,880	7.36
PW364	15 Jul 2020	10.07	13.5	284.3	41,952	6.84
PW364	22 Sep 2020	1.69	18	-132.4	56,579	7.73
PW364	14 Dec 2020	1.33	21.9	-116.1	52,723	7.71
PW364	15 Mar 2021	38.3	21.6	132	58,261	7.49
PW364	08 Jun 2021	1.15	14.1	-148.3	54,349	7.77
PW364	30 Aug 2021	1.99	15.7	-152.6	51,760	7.71
PW364	10 Jan 2022	1.2	22.4	-179.4	52,437	7.8
PW364	14 Mar 2022	0.74	25.7	-117.8	58,055	7.67
PW364	07 Jun 2022	2.54	14.6	2.1	54,787	7.83
PW364	05 Sep 2022	0.8	16.1	-32	44,920	7.49
PW364	12 Dec 2022	0.75	21.2	-291.7	52,093	7.55
PW364	13 Mar 2023	0.83	23.9	-76.5	45,869	6.86
PW364	07 Jun 2023	2.32	15.8	110.8	52,452	7.8
PW364	05 Sep 2023	2.32	15.8	110.8	52,452	7.8
PW367	08 Jan 2020	3.24	23.4	-340.3	41,500	6.84
PW367	31 Mar 2020	1.97	20.3	-418.7	58,689	6.93
PW367	15 Jul 2020	7.22	14.6	-26	43,502	7.62
PW367	22 Sep 2020	1.17	19	-272.9	57,337	7.66
PW367	15 Dec 2020	0.56	26.1	-228.1	55,209	7.16
PW367	15 Mar 2021	0.26	22.2	-263	59,018	7.24
PW367	09 Jun 2021	4.66	15.3	95	54,591	8.05
PW367	01 Sep 2021	2.17	16.7	9.9	49,987	7.46
PW367	11 Jan 2022	0.19	26.8	-370.8	60,793	7.02
PW367	14 Mar 2022	0.92	25.2	-45.2	58,624	7.23
PW367	07 Jun 2022	15.21	14.5	-41.2	41,275	7.53
PW367	05 Sep 2022	5.16	19.7	72.7	45,001	7.9
PW367	13 Dec 2022	0.47	19.5	-268.4	39,928	7.35
PW367	14 Mar 2023	0.68	23.8	31.6	59,585	7.33
PW367	07 Jun 2023	4.92	15.9	111.1	38,086	7.3
PW367	05 Sep 2023	4.92	15.9	111.1	38,086	7.3
PW368	08 Jan 2020	1.9	22.7	-110.7	41,833	7.65
PW368	01 Apr 2020	8.09	19.5	-385.6	52,861	7.07
PW368	20 Jul 2020	4.51	16.3	0.8	17,792	
PW368	22 Sep 2020	0.72	18.5	-237.9	39,335	7.64
PW368	15 Dec 2020	2.04	23.6	-258.5	47,485	7.44
PW368	15 Mar 2021	0.69	23.9	7.9	57,703	7.65
PW368	10 Jun 2021	5.95	19.4	76.1	39,536	8
PW368	01 Sep 2021	5.05	16.6	91.8	51,073	7.46
PW368	11 Jan 2022	1.02	24.6	-146.6	28,474	7.75

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	Date					
PW368	08 Jun 2022	0.01	15.4	153		7.48
PW368	05 Sep 2022	0.38	20.7	-327.3	44,515	7.51
PW368	12 Dec 2022	0.31	26	-308.7	42,158	7.37
PW368	13 Mar 2023	0.49	25.2	-370.8	60,951	6.33
PW369	31 Mar 2020	2.65	22.1	67.5	43,880	7.36
PW369	15 Jul 2020	7.73	14.8	4.1	43,326	7.5
PW369	24 Sep 2020	8.17	19.1	-2.3	56,648	7.47
PW369	15 Dec 2020	0.65	24.2	-238.5	56,933	7.44
PW369	16 Mar 2021	0.77	23.6	-55	57,841	7.38
PW369	09 Jun 2021	5.59	16.1	101.1	53,760	8.08
PW369	01 Sep 2021	6.38	16.5	-100.5	24,706	6.82
PW369	10 Jan 2022	1.13	24.3	-215	57,939	7.49
PW369	14 Mar 2022	0.72	25.9	-152.3	58,077	7.46
PW369	07 Jun 2022	15.64	12.9	63.8	40,112	7.59
PW369	05 Sep 2022	6.07	17.4	92.6	41,771	7.77
PW369	13 Dec 2022	0.41	19.2	-310.4	55,563	7.36
PW369	14 Mar 2023	1.07	22.3	-68.2	69,257	7.34
PW369	07 Jun 2023	5.46	15.4	103	48,690	7.66
PW369	05 Sep 2023	5.46	15.4	103	48,690	7.66
PW374	08 Jan 2020	25.94	23.2	-87.8	35,007	7.7
PW374	30 Mar 2020	7.01	22.2	-26.7	24,093	8.26
PW374	21 Jul 2020	6.61	15.7	7.1	44,268	8.2
PW374	21 Sep 2020	3.73	16.7	42.5	57,017	7.87
PW374	14 Dec 2020	3.67	22.3	35.6	57,881	7.86
PW374	15 Mar 2021	3.51	25.3	28.9	58,314	7.97
PW374	10 Jun 2021	3.83	17.4	60.3	53,469	8.53
PW374	01 Sep 2021	5.73	15.9	-142.9	52,210	8
PW374	13 Jan 2022	1.29	24.8	71.2	55,449	7.96
PW374	16 Mar 2022	3.31	25	1.5	57,201	7.9
PW374	09 Jun 2022	4.55	17.4	14.2	53,260	7.99
PW374	06 Sep 2022	3.58	16.9	-9.8	46,041	7.86
PW374	13 Dec 2022	8.82	20.8	5	52,204	7.96
PW374	14 Mar 2023	3.67	26.6	-69.5	54,052	7.28
PW374	06 Jun 2023	5.18	13.7	-128.3	54,879	7.94
PW374	04 Sep 2023	5.18	13.7	-128.3	54,879	7.94
PW375	08 Jan 2020	12.59	22	-36.4	42,272	79.1
PW375	30 Mar 2020	5.61	21.7	-12.4	51,183	8.16
PW375	21 Jul 2020	6.09	14.7	9.9	43,714	8.02
PW375	21 Sep 2020	3.55	16.5	36	56,952	8.01
PW375	14 Dec 2020	2.31	24	-8.8	55,851	7.78
PW375	15 Mar 2021	3.34	23.9	23.7	57,606	8
PW375	10 Jun 2021	3.89	17.5	54.8	53,567	8.68
PW375	01 Sep 2021	5.27	15.8	-142.9	52,402	7.94
PW375	13 Jan 2022	1.58	24.6	65.7	52,821	7.95
PW375	16 Mar 2022	4.99	23.4	37.3	44,720	7.94
PW375	09 Jun 2022	3.69	17.3	12.9	53,245	8.04
PW375	06 Sep 2022	3.52	17.1	26.8	43,774	7.7
PW375	13 Dec 2022	2.97	20.3	16.1	50,997	7.82
PW375	14 Mar 2023	4.8	27.4	-88.5	33,806	7.24
PW375	06 Jun 2023	5.35	14	-129	53,458	7.81
PW375	04 Sep 2023	5.35	14	-129	53,458	7.81
PW378	08 Jan 2020	4.87	22.3	-63.6	47,074	7.9
PW378	30 Mar 2020	5.99	22	-19.8	51,079	8.23
PW378	21 Jul 2020	4.95	16.1	4.8	43,398	7.95
PW378	21 Sep 2020	4.6	15.4	31.1	56,705	7.97
PW378	14 Dec 2020	1.41	24.8	-86.6	54,510	7.76
PW378	15 Mar 2021	2.54	23.5	31.7	57,464	7.93
PW378	10 Jun 2021	3.57	18.2	38.6	53,363	8.44
PW378	01 Sep 2021	5.75	16	-153.8	52,460	7.95
PW378	13 Jan 2022	1.95	26.2	79.9	55,543	7.83
PW378	16 Mar 2022	5.05	24.1	45.4	49,057	7.94
PW378	09 Jun 2022	5.43	16.9	20.3	53,317	7.96
PW378	06 Sep 2022	3.4	17.3	13.4	46,871	7.72
PW378	13 Dec 2022	3.5	20.1	-8.9	49,884	7.65
PW378	14 Mar 2023	5.46	28.7	-121.4	25,742	7.32
PW378	06 Jun 2023	4.51	13.7	-124.7	53,916	7.81
PW378	04 Sep 2023	4.51	13.7	-124.7	53,916	7.81
PW380	02 Apr 2020	9.25	22.7	152.7	56,049	8.1
PW380	02 Apr 2020	9.25	22.7	152.7	56,049	8.1
PW380	21 Jul 2020	5.27	16.4	7.3	18,484	
PW380	24 Sep 2020	6.66	17.1	75.5	56,307	8.28
PW380	16 Dec 2020	4.6	23.4	60.3	55,051	7.93
PW380	17 Mar 2021	4.34	24.2	108.2	59,060	7.76
PW380	08 Jun 2021	4.75	18.5	43.4	54,758	8
PW380	30 Aug 2021	5.43	17.3	67.3	52,878	8.11
PW380	11 Jan 2022	2.77	24.8	60.6	56,023	8.01
PW380	14 Mar 2022	3.16	25.6	64.5	56,359	7.93
PW380	07 Jun 2022	12.07	15.9	37.6	46,611	7.89
PW380	07 Sep 2022	8.48	15.7	111.2	46,559	8.15
PW380	12 Dec 2022	0.94	22.3	45	56,528	7.9
PW380	16 Mar 2023	5.12	24.1	75.9	56,621	7.84
PW380	07 Jun 2023	3.59	18.2	-103.1	53,419	7.84
PW380	05 Sep 2023	3.59	18.2	-103.1	53,419	7.84
PW381	02 Apr 2020	3.81	22.5	143.1	53,296	8.08
PW381	02 Apr 2020	6.61	23.1	143.1	3,425	7.93
PW381	02 Apr 2020	6.61	23.1	140.3	3,425	7.93
PW381	02 Apr 2020	6.61	23.1	140.3	3,425	7.93
PW381	21 Jul 2020	4.43	17.7	11.3	18,712	
PW381	24 Sep 2020	6.43	17.5	64.3	56,340	8.29
PW381	16 Dec 2020	3.35	22.6	60.7	56,056	7.92
PW381	17 Mar 2021	3.59	24	104.5	56,218	7.85
PW381	08 Jun 2021	4.69	17.8	-6	54,811	8.19
PW381	30 Aug 2021	5.78	17.4	63	52,556	8.14
PW381	11 Jan 2022	3.33	23.1	55.5	56,267	8.09
PW381	14 Mar 2022	3.62	25.8	60.7	56,688	7.96
PW381	07 Jun 2022	6.31	17.6	52.4	48,013	7.95
PW381	07 Sep 2022	7.99	15.4	109.1	53,813	8.16

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
PW381	**12 Dec 2022**	4.49	24	44	57,014	8.15
PW381	**16 Mar 2023**	5.27	23.6	78.8	55,097	8
PW381	**07 Jun 2023**	4.08	18.4	84.2	53,945	8.02
PW381	**05 Sep 2023**	4.08	18.4	84.2	53,945	8.02
PW401	**02 Apr 2020**	5.02	22.3	162	55,612	8.3
PW401	**02 Apr 2020**	5.02	22.3	162	55,612	8.3
PW401	**02 Apr 2020**	5.02	22.3	162	55,612	8.3
PW401	**02 Apr 2020**	5.02	22.3	162	55,612	8.3
PW401	**02 Apr 2020**	5.02	22.3	162	55,612	8.3
PW401	**21 Jul 2020**	6.01	17.2	14.6	18,593	
PW401	**23 Sep 2020**	6.52	17	79.8	56,484	8.21
PW401	**16 Dec 2020**	3.3	22.5	65.9	56,682	7.45
PW401	**17 Mar 2021**	4.41	24	107.4	53,025	7.76
PW401	**08 Jun 2021**	5.21	18.2	40	54,562	7.28
PW401	**30 Aug 2021**	6.31	17.3	67.9	52,291	8.1
PW401	**11 Jan 2022**	2.43	23.9	59.5	56,084	7.99
PW401	**14 Mar 2022**	3.28	25.9	64.5	56,361	7.81
PW401	**07 Jun 2022**	11.61	18.1	26.3	43,560	7.92
PW401	**07 Sep 2022**	7.71	15.8	112.9	53,391	8.19
PW401	**12 Dec 2022**	4.57	24.3	45.8	56,161	8.11
PW401	**07 Jun 2023**	4.5	17.9	82.7	54,022	8
PW401	**05 Sep 2023**	4.5	17.9	82.7	54,022	8
PW405	**14 Jan 2020**	2.84	26.6	-140.2	63,309	7.64
PW405	**01 Apr 2020**	1.45	22.2	-91.9	48,229	7.1
PW405	**22 Jul 2020**	6.75	14.8	26.1	17,134	
PW405	**21 Sep 2020**	1.3	17.1	-218.7	56,882	7.74
PW405	**15 Dec 2020**	0.58	22.1	-152.9	56,353	7.61
PW405	**15 Mar 2021**	1.93	26.7	83.3	61,893	7.52
PW405	**10 Jun 2021**	5.01	19.2	28.1	14,825	7.9
PW405	**31 Aug 2021**	1.63	19.1	-139	51,865	7.8
PW405	**14 Jan 2022**	0.65	24.9	-158	55,012	7.77
PW405	**16 Mar 2022**	2.64	25.6	44.4	59,870	7.7
PW405	**07 Jun 2022**	2.37	13.4	53.6		7.83
PW405	**07 Sep 2022**	6.43	12.6	123	52,883	7.89
PW405	**13 Dec 2022**	1.52	20.3	-212.9	67,797	7.73
PW405	**14 Mar 2023**	2.96	28.1	-28.7	54,952	7.25
PW405	**08 Jun 2023**	4.06	15.3	-106.7	52,170	7.85
PW405	**05 Sep 2023**	4.06	15.3	-106.7	52,170	7.85
PW407	**14 Jan 2020**	4.62	26.2	-124.9	59,344	7.62
PW407	**01 Apr 2020**	1.05	26.2	-30.3	21,748	7.63
PW407	**22 Jul 2020**	5.87	14.4	18.9	17,196	
PW407	**21 Sep 2020**	1.41	18.3	-199.4	57,061	7.87
PW407	**15 Dec 2020**	0.46	24.3	-131.7	58,616	7.55
PW407	**15 Mar 2021**	4.61	25.8	45.1	56,611	7.88
PW407	**10 Jun 2021**	5.41	18.8	-51	25,729	7.94
PW407	**31 Aug 2021**	1.16	18.6	-136.7	52,860	7.81
PW407	**14 Jan 2022**	0.78	24.9	-25.5	55,551	7.73
PW407	**16 Mar 2022**	2.12	25.6	13.9	57,626	7.8
PW407	**07 Jun 2022**	2.05	14.8	27.1		7.67
PW407	**07 Sep 2022**	3.59	14.4	26.8	43,012	7.74
PW407	**13 Dec 2022**	1.16	20.6	-19.9	66,734	7.57
PW407	**14 Mar 2023**	3.02	27.3	-58.3	50,321	7
PW407	**08 Jun 2023**	4.22	15.3	-105.9	51,770	7.84
PW407	**05 Sep 2023**	4.22	15.3	-105.9	51,770	7.84
PW409	**14 Jan 2020**	3.44	28	-199	34,189	7.47
PW409	**01 Apr 2020**	1.15	23.7	-8.7	53,391	7.33
PW409	**21 Jul 2020**	6.32	14	14.1	41,000	7.81
PW409	**22 Sep 2020**	1.18	17.7	-230.8	56,086	7.8
PW409	**15 Dec 2020**	0.41	22.4	-137.3	56,691	7.65
PW409	**17 Mar 2021**	3.34	30.7	67.5	59,270	7.57
PW409	**10 Jun 2021**	4.24	18.2	29	53,924	8.1
PW409	**31 Aug 2021**	1.58	18.9	-144.8	53,167	7.81
PW409	**14 Jan 2022**	0.7	25.2	-78.1	56,703	7.82
PW409	**16 Mar 2022**	3.56	24.6	32.9	47,677	7.61
PW409	**07 Jun 2022**	4.14	14.3	47.2		7.84
PW409	**06 Sep 2022**	1.53	17.4	-119.8	46,427	7.58
PW409	**13 Dec 2022**	0.61	19.2	-230.5	50,946	7.56
PW409	**14 Mar 2023**	3.86	26.1	-14	33,119	6.77
PW409	**08 Jun 2023**	5.59	15.1	-113.1	19,386	7.79
PW409	**04 Sep 2023**	5.59	15.1	-113.1	19,386	7.79
PW411	**14 Jan 2020**	5.19	26.2	-80.7	58,636	7.61
PW411	**01 Apr 2020**	2	21.7	-121.3	33,361	7.41
PW411	**21 Jul 2020**	7.73	14.5	39.1	22,957	8.03
PW411	**22 Sep 2020**	1.1	18	-232.1	56,881	7.82
PW411	**15 Dec 2020**	0.85	23.6	-109.8	56,869	7.73
PW411	**18 Mar 2021**	3.71	25.5	46.4	57,559	7.6
PW411	**09 Jun 2021**	4.07	14.8	65.5	54,743	7.85
PW411	**01 Sep 2021**	5.81	15.9	-154.2	52,558	7.83
PW411	**14 Jan 2022**	1.49	24.9	38.4	55,690	7.85
PW411	**16 Mar 2022**	2.45	25.2	45.1	58,040	7.79
PW411	**07 Jun 2022**	4.03	15	84.2		7.9
PW411	**06 Sep 2022**	5.58	16.9	-1.9	41,241	7.79
PW411	**14 Dec 2022**	1.37	22.6	-85.6	55,245	7.6
PW411	**15 Mar 2023**	3.46	25.3	84.9	57,239	7.47
PW411	**08 Jun 2023**	6.51	17.5	83.4	52,476	7.88
PW411	**04 Sep 2023**	6.51	17.5	83.4	52,476	7.88
PW413	**14 Jan 2020**	4.48	26.7	-157.2	32,515	7.6
PW413	**01 Apr 2020**	1.45	22.8	-13.4	31,446	7.42
PW413	**21 Jul 2020**	6.07	13.8	45.9	43,485	7.36
PW413	**22 Sep 2020**	3.35	19	-198.4	57,590	7.86
PW413	**15 Dec 2020**	0.44	22.9	-158.1	56,487	7.7
PW413	**18 Mar 2021**	3.31	24.1	69.8	59,350	7.67
PW413	**09 Jun 2021**	4.56	15.1	54.4	54,691	7.77
PW413	**01 Sep 2021**	6.09	16.1	104.6	5,103	8.03
PW413	**14 Jan 2022**	1.9	25	38.3	58,987	7.86
PW413	**16 Mar 2022**	2.74	25	39.2	57,594	7.79
PW413	**07 Jun 2022**	4.46	14.8	64.8		7.89

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
PW413	**06 Sep 2022**	3.44	16.5	11.6	41,255	7.74
PW413	**14 Dec 2022**	1.4	24.5	-178	57,293	7.73
PW413	**15 Mar 2023**	3.9	25.1	82.3	57,113	7.72
PW413	**08 Jun 2023**	5.13	17.5	83.9	52,509	7.87
PW413	**04 Sep 2023**	5.13	17.5	83.9	52,509	7.87
PW415	**14 Jan 2020**	5.51	27.9	-70.8	30,883	7.73
PW415	**01 Apr 2020**	2.07	23.7	-18.1	18,013	7.36
PW415	**21 Jul 2020**	7.21	15.1	45.2	22,268	8.03
PW415	**22 Sep 2020**	1.56	19.3	-175.6	57,521	7.86
PW415	**15 Dec 2020**	0.99	23.7	-25.3	57,175	7.66
PW415	**18 Mar 2021**	3.78	24.9	66.9	39,900	7.86
PW415	**09 Jun 2021**	5.52	15.1	37.5	54,827	7.83
PW415	**01 Sep 2021**	6.27	16.6	87.4	52,152	7.98
PW415	**14 Jan 2022**	1.64	25.2	31.7	57,414	7.94
PW415	**16 Mar 2022**	3.37	25.8	9.5	48,341	7.71
PW415	**07 Jun 2022**	4.12	15.3	68.1		7.93
PW415	**06 Sep 2022**	3.1	17.1	24.8	41,952	7.76
PW415	**14 Dec 2022**	0.91	23.7	-60.9	52,641	7.64
PW415	**15 Mar 2023**	4	25.3	79.3	57,115	7.85
PW415	**08 Jun 2023**	4.71	17.6	84.4	52,447	7.6
PW415	**04 Sep 2023**	4.71	17.6	84.4	52,447	7.6

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
SW130	**30 Mar 2020**	3.6	23.4	25.6	54,247	7.94
SW130	**15 Jul 2020**	7.16	14.8	132.5	43,600	7.99
SW130	**22 Sep 2020**	5.02	19.5	36.2	55,328	8.05
SW130	**14 Dec 2020**	3.62	21.9	-66.6	52,321	8.05
SW130	**15 Mar 2021**	3.97	214	20.1	51,889	7.93
SW130	**08 Jun 2021**	4.9	15.6	-16	54,570	8.27
SW130	**30 Aug 2021**	5.59	16.4	-123.8	53,101	7.97
SW130	**10 Jan 2022**	4.43	19.8	-8.3	48,660	8.22
SW130	**14 Mar 2022**	4.47	22.9	4.7	54,308	8
SW130	**07 Jun 2022**	5.66	16.5	-1.4	54,372	8
SW130	**05 Sep 2022**	4.4	15.4	28.3	43,551	6.45
SW130	**12 Dec 2022**	3.95	21.5	-24.5	54,435	7.86
SW130	**13 Mar 2023**	2.51	23.3	-90.8	60,356	7.11
SW130	**07 Jun 2023**	6.03	16.5	-7.4	53,503	8.06
SW130	**05 Sep 2023**	6.03	16.5	-7.4	53,503	8.06
SW132	**30 Mar 2020**	4.17	24.2	55.6	55,199	8.03
SW132	**15 Jul 2020**	7.54	14.5	107.8	43,302	7.99
SW132	**22 Sep 2020**	4.42	20.8	-3.1	55,837	8.15
SW132	**14 Dec 2020**	4.71	21.2	15.5	56,632	8.02
SW132	**15 Mar 2021**	3.93	22.3	7.2	52,769	7.81
SW132	**08 Jun 2021**	5.37	15.6	-40.1	54,346	8.29
SW132	**30 Aug 2021**	5.38	16.2	-132.1	53,095	7.99
SW132	**10 Jan 2022**	5.13	21.4	-16.6	50,570	8.26
SW132	**14 Mar 2022**	4.18	24.7	85.8	56,543	8.05
SW132	**07 Jun 2022**	5.21	15.9	-9.7	54,347	7.91
SW132	**05 Sep 2022**	2.74	18.4	-149.5	47,972	7.78
SW132	**12 Dec 2022**	4.94	23.4	81.3	54,931	7.99
SW132	**13 Mar 2023**	2.88	24.9	-225.1	52,004	7.01
SW132	**07 Jun 2023**	5.43	17	-37.3	53,231	8.04
SW132	**05 Sep 2023**	5.43	17	-37.3	53,231	8.04
SW134	**31 Mar 2020**	3.52	22	57.8	52,423	7.92
SW134	**15 Jul 2020**	11.79	14.6	113.9	43,369	7.73
SW134	**22 Sep 2020**	5.34	21.6	31.6	55,680	8.26
SW134	**14 Dec 2020**	4.15	21.9	-40.1	56,544	7.98
SW134	**15 Mar 2021**	3.45	24	33.1	56,478	8.08
SW134	**08 Jun 2021**	4.02	16.5	127.1	53,625	8.18
SW134	**30 Aug 2021**	4.34	16.7	-147.8	52,888	7.88
SW134	**10 Jan 2022**	3.36	20.7	-119.6	55,557	8.07
SW134	**14 Mar 2022**	2.57	26.9	-183.9	59,412	7.95
SW134	**07 Jun 2022**	5.38	14.4	-9.5	54,465	7.98
SW134	**05 Sep 2022**	4.58	19.3	-124.4	49,207	7.94
SW134	**12 Dec 2022**	4	25	-224.9	56,361	8.08
SW134	**13 Mar 2023**	3.5	26.2	-106.6	53,421	7.15
SW134	**07 Jun 2023**	1.23	17.7	-160.6	28,234	8.02
SW134	**05 Sep 2023**	1.23	17.7	-160.6	28,234	8.02
SW150	**08 Jan 2020**	5.9	25.8	42.2	57,907	8.18
SW150	**30 Mar 2020**	5.94	23.7	-384	52,364	7.8
SW150	**20 Jul 2020**	6.88	17	21.3	18,540	
SW150	**23 Sep 2020**	9.43	15.5	91.3	45,427	8.23
SW150	**14 Dec 2020**	4.72	22.1	48		8.03
SW150	**15 Mar 2021**	10.48	25.2	34	56,705	8.26
SW150	**08 Jun 2021**	5.32	16.8	133	54,609	8.22
SW150	**30 Aug 2021**	5.08	17	13.2	51,820	7.93
SW150	**10 Jan 2022**	4.04	24.8	131	54,736	8.14
SW150	**15 Mar 2022**	3.37	26.2	55.9	56,744	8.13
SW150	**08 Jun 2022**	5.66	15.1	22.5	54,333	7.8
SW150	**05 Sep 2022**	5.54	16.2	3.1	53,628	8.1
SW150	**12 Dec 2022**	5.2	23.7	-87.3	56,608	8.1
SW150	**15 Mar 2023**	4.23	24.1	95.8	50,461	6.94
SW150	**07 Jun 2023**	4.8	16.1	27.7	57,150	8
SW150	**11 Sep 2023**	4.8	16.1	27.7	57,150	8
SW152	**08 Jan 2020**	4.84	25.6	27.5	58,077	8.2
SW152	**30 Mar 2020**	5.52	24.2	-369.3	52,771	7.82
SW152	**20 Jul 2020**	6.27	18.2	15.8	18,667	
SW152	**23 Sep 2020**	11.58	15.2	93.9	45,153	8.19
SW152	**14 Dec 2020**	4.95	23.4	135.4	55,960	8.02
SW152	**15 Mar 2021**	4.32	25.2	87.1	55,957	8.09
SW152	**08 Jun 2021**	4.45	17.7	128.5	54,754	8.23
SW152	**30 Aug 2021**	5.13	16.8	24.8	51,556	7.93
SW152	**10 Jan 2022**	4.11	24.5	124.8	55,303	8.25
SW152	**15 Mar 2022**	4.45	26.6	54.4	56,737	8.15
SW152	**08 Jun 2022**	5.63	15.1	29.7	54,382	7.93
SW152	**05 Sep 2022**	6.31	16.4	32	54,267	8.13
SW152	**12 Dec 2022**	3.38	24	-32.7	56,363	8.08
SW152	**15 Mar 2023**	3.32	26.9	-92.2	53,025	7.12
SW152	**07 Jun 2023**	3.97	16.4	44.8	60,443	8.03
SW152	**11 Sep 2023**	3.97	16.4	44.8	60,443	8.03
SW154	**08 Jan 2020**	4.13	24.6	25.6	56,911	8.2
SW154	**30 Mar 2020**	6.78	23.3	-369	51,950	7.78
SW154	**20 Jul 2020**	6.27	16.8	20.9	18,529	
SW154	**22 Sep 2020**	5.34	20.9	41.1	55,703	8.26
SW154	**14 Dec 2020**	5.54	23.4	34.5	55,380	8.05
SW154	**15 Mar 2021**	4.11	21.4	36.5	56,985	7.88
SW154	**08 Jun 2021**	3.4	17	105.2	54,785	8.24
SW154	**30 Aug 2021**	6.47	17.1	30.9	51,910	7.95
SW154	**10 Jan 2022**	4.14	24.8	123.4	55,198	8.26
SW154	**15 Mar 2022**	5.38	26.2	20.3	55,888	8.08
SW154	**08 Jun 2022**	6.15	15.6	-17.6	54,362	7.9
SW154	**05 Sep 2022**	5.47	16.4	42.7	54,169	8.09
SW154	**12 Dec 2022**	3.47	24.5	-26.1	56,550	8.16
SW154	**15 Mar 2023**	2.89	25.1	-7.5	51,507	7.19
SW154	**07 Jun 2023**	3.53	19.6	43.2	67,107	7.97
SW154	**11 Sep 2023**	3.53	19.6	43.2	67,107	7.97
SW156	**08 Jan 2020**	5.6	24.8	19.3	56,063	8.11
SW156	**30 Mar 2020**	5.1	23.5	-397.7	52,157	7.68

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	Date					
SW156	20 Jul 2020	6.26	16.9	17.6	18,577	
SW156	23 Sep 2020	10.99	14.6	116.4	44,567	8.16
SW156	14 Dec 2020	3.43	23.6	49.5	55,331	8.04
SW156	15 Mar 2021	57.2	22.4	43.6	57,225	7.95
SW156	08 Jun 2021	1.1	16	-185.4	54,693	7.83
SW156	30 Aug 2021	6.13	17.1	24.2	52,057	8.01
SW156	10 Jan 2022	3.8	25.1	124.3	55,276	8.26
SW156	15 Mar 2022	5.47	25.8	55.3	55,646	7.94
SW156	08 Jun 2022	6.12	15.8	13.9	54,287	7.9
SW156	05 Sep 2022	5.54	16.4	50.3	54,193	8.12
SW156	12 Dec 2022	3.92	25.6	-61.5	56,408	8.17
SW156	15 Mar 2023	3.77	24.7	0.2	50,970	7.14
SW156	07 Jun 2023	2.92	19.5	56.2	68,610	7.96
SW156	11 Sep 2023	2.92	19.5	56.2	68,610	7.96
SW305	08 Jan 2020	6.01	36.2	21.2	53,542	8.16
SW305	31 Mar 2020	5.01	24.2	26	55,805	8.04
SW305	20 Jul 2020	7.35	16.9	15.7	18,674	
SW305	22 Sep 2020	6.41	20.6	-131.4	54,670	8.19
SW305	15 Dec 2020	5.78	26.2	-120	54,290	8.17
SW305	15 Mar 2021	4.17	24.2	30.9	57,377	8.3
SW305	08 Jun 2021	4.34	19	13.7	54,564	8.17
SW305	01 Sep 2021	5.17	17	-144.2	52,253	7.94
SW305	11 Jan 2022	4.28	25.3	-64.6	58,620	8.15
SW305	18 Mar 2022	3.5	25.8	-219.1	56,632	8.05
SW305	08 Jun 2022	3.4	16.1	115.3		7.9
SW305	05 Sep 2022	4.58	20.9	-117.5	47,079	7.81
SW305	12 Dec 2022	3.07	26.2	-134.5	52,979	7.8
SW305	13 Mar 2023	5.44	26.8	-107.2	51,790	7.13
SW309	31 Mar 2020	7.01	22.8	-409.6	52,327	7.91
SW309	22 Jul 2020	8.2	18	11.8	18,803	
SW309	23 Sep 2020	7.21	19.7	82.4	56,248	8.43
SW309	15 Dec 2020	0.04	23.9	-284.6	56,055	7.44
SW309	15 Mar 2021	3.44	24.1	34.9	57,313	8.31
SW309	08 Jun 2021	4.57	18.7	38.1	54,325	8.16
SW309	31 Aug 2021	5.15	18.5	-131.1	52,731	7.93
SW309	13 Jan 2022	4.09	23.6	17.6	55,170	8.31
SW309	16 Mar 2022	3.86	23.9	12.6	54,237	7.98
SW309	07 Jun 2022	1.63	15.9	97.6		7.96
SW309	06 Sep 2022	6.14	18.5	18.9	43,478	8.06
SW309	13 Dec 2022	4.93	19.6	28.8	64,136	8.19
SW309	14 Mar 2023	4.58	25.3	95.6	56,717	8.13
SW309	08 Jun 2023	4.72	17.9	43.6	53,313	7.94
SW309	04 Sep 2023	4.72	17.9	43.6	53,313	7.94
SW310	31 Mar 2020	8.11	23.4	-411.5	53,515	7.83
SW310	22 Jul 2020	6.24	18.1	9.9	18,770	
SW310	23 Sep 2020	5.74	19.8	92.4	56,288	8.38
SW310	15 Dec 2020	3.42	23.4	-213.3	55,586	7.91
SW310	15 Mar 2021	5.08	23.7	35.3	57,326	8.31
SW310	08 Jun 2021	4.59	18.5	44.3	54,526	8.19
SW310	31 Aug 2021	5.78	18.6	-149.8	53,300	8.09
SW310	13 Jan 2022	3.62	23.7	31.1	55,167	8.25
SW310	16 Mar 2022	4.14	23.3	57.9	54,303	8.02
SW310	07 Jun 2022	2.02	13.1	140		8.04
SW310	06 Sep 2022	5.81	17.6	46.9	42,081	8.03
SW310	13 Dec 2022	4.61	19.6	37.8	64,273	8.22
SW310	14 Mar 2023	4.35	24.6	79.8	56,620	8.13
SW310	08 Jun 2023	4.54	17.5	43.6	53,149	7.96
SW310	04 Sep 2023	4.54	17.5	43.6	53,149	7.96
SW311	01 Apr 2020	0.01	22.9	-328.8	52,743	7.77
SW311	22 Jul 2020	6.09	17.5	8.6	18,624	
SW311	23 Sep 2020	6.38	19.8	93.4	55,922	8.39
SW311	15 Dec 2020	4.98	23.2	65	55,470	8.07
SW311	16 Mar 2021	3.67	25.2	46.3	54,256	7.79
SW311	08 Jun 2021	4.54	18.3	47.9	54,459	8.18
SW311	31 Aug 2021	7.76	22.6	73.4	52,532	8.07
SW311	13 Jan 2022	4.69	23.4	5.7	54,300	8.28
SW311	16 Mar 2022	4.56	23.5	50.1	54,400	8.07
SW311	07 Jun 2022	1.94	13.7	77.7		7.87
SW311	06 Sep 2022	6.55	18.3	17.4	43,321	8.02
SW311	13 Dec 2022	4.97	19.6	44.5	64,272	8.24
SW311	14 Mar 2023	4.44	24.8	82.3	56,490	8.17
SW311	08 Jun 2023	4.52	18	42.7	53,782	8
SW311	04 Sep 2023	4.52	18	42.7	53,782	8
SW317	08 Jan 2020	13.02	21.2	-56.6	50,724	8.11
SW317	30 Mar 2020	7.26	22.5	29.1	51,782	8.16
SW317	21 Jul 2020	6.48	16.1	5.6	44,741	8.24
SW317	21 Sep 2020	5.8	17.2	23.4	55,117	6.17
SW317	14 Dec 2020	4.02	24.5	-11.7	55,238	8.11
SW317	16 Mar 2021	2.9	22.4	95	57,392	8.02
SW317	09 Jun 2021	6.23	15.6	86	54,368	8.09
SW317	31 Aug 2021	5.21	18.2	70.1	50,586	8.2
SW317	13 Jan 2022	3.29	25.3	89	54,634	8.11
SW317	16 Mar 2022	4.82	24.8	43.7	56,016	8.24
SW317	09 Jun 2022	5.89	15.9	20.9	53,342	8.01
SW317	06 Sep 2022	4.64	18.1	11.8	45,687	7.85
SW317	13 Dec 2022	3.76	20.5	10	51,189	7.95
SW317	14 Mar 2023	5.01	28.3	-143.9	55,378	7.42
SW317	06 Jun 2023	5.4	14.3	-130	54,524	8.14
SW317	04 Sep 2023	5.4	14.3	-130	54,524	8.14
SW318	08 Jan 2020	24.58	25.7	-21.9	50.43	7.99
SW318	30 Mar 2020	6.94	22.5	2.5	54,328	8.28
SW318	21 Jul 2020	5.48	16	1.6	44,825	8.24
SW318	21 Sep 2020	5.49	17.2	39.2	55,457	8.11
SW318	14 Dec 2020	4.86	22.7	23.8	54,887	8.14
SW318	16 Mar 2021	3.35	23	72.5	57,373	8.06
SW318	09 Jun 2021	5.52	16.5	43.3	54,493	8.16
SW318	31 Aug 2021	5.13	17.6	65.9	51,173	8.17

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
SW318	**13 Jan 2022**	1.54	25.2	64.3	55,490	8.19
SW318	**16 Mar 2022**	5.25	24.9	31.6	56,666	8.27
SW318	**09 Jun 2022**	6.01	16.3	20.2	54,234	8.13
SW318	**06 Sep 2022**	4.54	16.7	25	45,310	7.94
SW318	**13 Dec 2022**	4.47	20.8	16.9	51,242	7.98
SW318	**14 Mar 2023**	4.91	25.2	-79.5	51,496	7.32
SW318	**06 Jun 2023**	5.98	14.6	-133.1	54,216	8.13
SW318	**04 Sep 2023**	5.98	14.6	-133.1	54,216	8.13
SW319	**30 Mar 2020**	7.07	22.4	-4.2	54,127	8.3
SW319	**21 Jul 2020**	7.28	16	7.6	44,403	8.27
SW319	**21 Sep 2020**	5.18	17	47.9	56,641	8.13
SW319	**14 Dec 2020**	3.93	20.8	53.4	55,164	8.15
SW319	**16 Mar 2021**	3.11	24.2	3.1	54,842	7.73
SW319	**09 Jun 2021**	6.08	16	94.4	52,978	7.92
SW319	**31 Aug 2021**	4.95	17.9	67.8	51,342	8.12
SW319	**13 Jan 2022**	1.62	24.6	63.7	55,633	8.22
SW319	**16 Mar 2022**	3.31	25	-48.5	56,905	8.21
SW319	**09 Jun 2022**	6.39	15.8	15.4	54,233	8.1
SW319	**06 Sep 2022**	4.01	16.8	-81.7	45,580	7.91
SW319	**13 Dec 2022**	4.63	20.7	10.9	51,323	8.02
SW319	**14 Mar 2023**	4.67	24.5	-62.3	50,868	7.29
SW319	**06 Jun 2023**	5.47	14.8	-120.9	54,529	8.1
SW319	**04 Sep 2023**	5.47	14.8	-120.9	54,529	8.1
SW353	**21 Jul 2020**	7.36	17.6	25.1	18,659	
SW353	**23 Sep 2020**	5.05	21.1	87.9	56,252	8.22
SW353	**16 Dec 2020**	4.58	22.2	74.4	55,317	7.48
SW353	**16 Mar 2021**	4.19	24.9	5.1	57,163	8.02
SW353	**09 Jun 2021**	5.3	16	88.6	53,140	8.04
SW353	**30 Aug 2021**	6.62	17.5	81.6	52,460	8
SW353	**11 Jan 2022**	4.64	24.1	33.7	52,996	8.17
SW353	**14 Mar 2022**	4.45	25.7	72.6	55,745	7.98
SW353	**07 Jun 2022**	15.32	18.3	-3	48,190	7.83
SW353	**07 Sep 2022**	6.42	16.2	118.2	53,990	8.18
SW353	**12 Dec 2022**	4.49	23.7	55.1	56,024	7.93
SW353	**16 Mar 2023**	4.56	24.2	74	56,304	8.11
SW353	**07 Jun 2023**	3.96	18.9	80.8	53,706	8.13
SW353	**05 Sep 2023**	3.96	18.9	80.8	53,706	8.13
SW370	**31 Mar 2020**	2.62	22.3	-7.7	55,703	7.97
SW370	**15 Jul 2020**	6.87	15.3	-41	44,144	7.99
SW370	**24 Sep 2020**	4.42	19.6	-122.4	54,681	7.96
SW370	**15 Dec 2020**	4.17	27.1	-194.4	55,292	7.91
SW370	**17 Mar 2021**	5.35	28.6	49.2	56,199	7.96
SW370	**09 Jun 2021**	4.92	16	85.3	53,191	8.09
SW370	**01 Sep 2021**	6.15	16.4	-148.5	51,948	7.67
SW370	**10 Jan 2022**	4.43	25.8	-134.4	55,153	8.14
SW370	**14 Mar 2022**	3.2	28	-25.8	59,788	7.94
SW370	**07 Jun 2022**	16.61	14.1	-55.7	42,762	7.67
SW370	**05 Sep 2022**	6.54	17.8	63.2	42,646	7.98
SW370	**12 Dec 2022**	6.32	26.8	55.7	67,905	8.11
SW370	**14 Mar 2023**	1.36	24	-42.7	56,612	7.56
SW370	**07 Jun 2023**	5.34	14.7	90.7	52,834	7.93
SW370	**05 Sep 2023**	5.34	14.7	90.7	52,834	7.93
SW371	**08 Jan 2020**	13.47	29	36.7	53,812	8.22
SW371	**20 Jul 2020**	12.45	16.9	18.6	18,501	
SW371	**22 Sep 2020**	5	20.4	-136.7	54,165	8.17
SW371	**15 Dec 2020**	3.69	27.7	-126.3	53,972	8.34
SW371	**17 Mar 2021**	3.4	29	19.2	56,038	8.09
SW371	**09 Jun 2021**	5.13	16.5	26.8	54,469	8.15
SW371	**01 Sep 2021**	5.24	16.9	-139.3	51,199	7.76
SW371	**11 Jan 2022**	3.63	28.2	-142.1	57,733	8.12
SW371	**18 Mar 2022**	3.47	26	-167.2	56,482	8.02
SW371	**08 Jun 2022**	3.47	15.3	122.5		7.8
SW371	**05 Sep 2022**	3.59	21.3	-235.4	47,227	7.78
SW371	**12 Dec 2022**	5.59	27.8	-154.6	57,466	7.98
SW371	**13 Mar 2023**	3.2	27.9	-262.5	54,860	7.34
SW372	**08 Jan 2020**	5.89	25.1	48.1	55,087	8.2
SW372	**31 Mar 2020**	4.31	24	6.3	66,960	8.16
SW372	**20 Jul 2020**	6.78	17	15.6	18,735	
SW372	**22 Sep 2020**	5.62	20.7	-124.9	53,960	8.19
SW372	**15 Dec 2020**	4.87	23.7	12.8	55,961	8.24
SW372	**17 Mar 2021**	4.86	26.9	0.8	56,457	8.2
SW372	**09 Jun 2021**	4.36	16.1	8.2	54,535	8.15
SW372	**01 Sep 2021**	6.09	17.3	-152.4	52,046	7.96
SW372	**12 Jan 2022**	3.17	33.8	-6.8	54,644	8.09
SW372	**18 Mar 2022**	2.74	25.5	-239.5	56,145	8.15
SW372	**08 Jun 2022**	2.56	16.8	126.3		7.82
SW372	**06 Sep 2022**	5.06	14	-23.4	41,216	7.84
SW372	**12 Dec 2022**	6.24	28.1	-133.5	53,181	8.09
SW372	**14 Mar 2023**	2.83	26	-241.6	52,732	7.26
SW373	**08 Jan 2020**	8.28	25.1	57.1	1,193	8.26
SW373	**31 Mar 2020**	5.56	23.8	-0.04	56,004	8.19
SW373	**20 Jul 2020**	6.69	17.3	14.5	18,791	
SW373	**22 Sep 2020**	8.58	20.9	-135.2	54,251	8.14
SW373	**15 Dec 2020**	5.75	24.1	-18.5	54,728	8.05
SW373	**17 Mar 2021**	4.04	25.2	55.2	57,314	8.21
SW373	**10 Jun 2021**	4.62	18	-10	52,927	8.12
SW373	**30 Aug 2021**	4.93	17.2	166.1	48,992	7.5
SW373	**12 Jan 2022**	4.7	27.8	14	55,809	8.25
SW373	**18 Mar 2022**	3.66	25.5	-46.4	55,753	8
SW373	**08 Jun 2022**	3.63	16.6	110.8		8.01
SW373	**06 Sep 2022**	4.94	15.1	8.2	42,752	7.19
SW373	**12 Dec 2022**	6.8	28.2	-69.8	57,872	7.97
SW373	**14 Mar 2023**	2.09	26.2	-18.6	50,749	7
SW382	**21 Jul 2020**	5.86	17.3	12	18,592	
SW382	**23 Sep 2020**	6.18	19.3	70.4	56,644	8.32
SW382	**16 Dec 2020**	4.61	21.6	80.1	55,161	8.14
SW382	**17 Mar 2021**	4.36	25.9	74.4	55,200	8.04

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	Date					
SW382	10 Jun 2021	3.75	19.1	2.2	53,643	8.09
SW382	30 Aug 2021	5.2	18.2	63.8	52,620	8.13
SW382	11 Jan 2022	3.82	24.6	42.8	54,142	8.25
SW382	14 Mar 2022	3.92	26.3	61.9	56,095	8.06
SW382	07 Jun 2022	6.56	17.6	45.5	47,986	7.95
SW382	07 Sep 2022	6.47	15.8	109.1	54,119	8.19
SW382	12 Dec 2022	4.38	23.3	47.1	56,259	8.21
SW382	16 Mar 2023	5.39	24	75.4	56,503	8.14
SW382	07 Jun 2023	4.38	18.6	83.7	53,968	8.07
SW382	05 Sep 2023	4.38	18.6	83.7	53,968	8.07
SW383	21 Jul 2020	10	17.2	13	18,647	
SW383	23 Sep 2020	6.29	19.2	78.7	56,099	8.31
SW383	16 Dec 2020	4.71	21.9	76.1	55,319	8.15
SW383	17 Mar 2021	4.95	24.7	71.1	55,855	8.08
SW383	10 Jun 2021	3.09	19.2	44.7	53,039	8.68
SW383	30 Aug 2021	5.93	17.6	61.8	52,224	8.13
SW383	11 Jan 2022	3.87	24.5	65.8	54,062	8.26
SW383	14 Mar 2022	4.27	25.7	64	56,257	8.04
SW383	07 Jun 2022	10.43	18	33.6	48,455	7.94
SW383	07 Sep 2022	6.49	15.9	111.3	53,190	8.2
SW383	12 Dec 2022	4.17	23.3	40.9	56,088	8.14
SW383	16 Mar 2023	4.38	23.6	74.8	56,348	8.15
SW383	07 Jun 2023	4.78	18.6	83.5	53,978	8.12
SW383	05 Sep 2023	4.78	18.6	83.5	53,978	8.12
SW384	21 Jul 2020	7.67	17.3	8.9	18,618	
SW384	16 Dec 2020	4.23	22.5	70.5	55,381	8.13
SW384	17 Mar 2021	4.39	24.5	71.3	56,098	8.11
SW384	10 Jun 2021	4.29	20.5	83.2	53,296	8.24
SW384	30 Aug 2021	6.21	17.1	82.2	52,220	8.08
SW384	11 Jan 2022	3.82	23.9	59.1	53,042	8.24
SW384	14 Mar 2022	4.05	25.8	65.7	56,226	8.05
SW384	07 Jun 2022	13.4	17.8	16.7	47,984	7.9
SW384	07 Sep 2022	6.07	15.8	113.6	53,380	8.2
SW384	12 Dec 2022	4.29	23.8	47.4	56,412	8.09
SW384	16 Mar 2023	4.65	24	72.1	56,847	7.13
SW384	07 Jun 2023	4.02	18.5	81.6	53,075	8
SW384	05 Sep 2023	4.02	18.5	81.6	53,075	8
SW406	14 Jan 2020	7.13	26.8	-75.2	31,500	8.05
SW406	01 Apr 2020	3.79	27.7	49.4	58,512	8.02
SW406	22 Jul 2020	5.27	15.6	20	18,223	
SW406	21 Sep 2020	4.24	20.2	-113.3	56,799	8.09
SW406	15 Dec 2020	4.84	22	-65.4	54,808	7.9
SW406	17 Mar 2021	4.82	24.4	71	55,591	8.14
SW406	10 Jun 2021	3.64	20.4	50.6	53,197	7.95
SW406	31 Aug 2021	4.74	21.6	-119.2	52,058	8.03
SW406	14 Jan 2022	4.05	25.2	-57.6	55,317	8.03
SW406	16 Mar 2022	4.4	26.5	41.3	58,606	8.19
SW406	07 Jun 2022	2.09	15.6	43.9		7.9
SW406	07 Sep 2022	7.45	13.6	111.7	53,221	8.2
SW406	13 Dec 2022	4.86	19.5	82.9	56,255	8.26
SW406	14 Mar 2023	3.91	26.7	-25.6	53,550	7.21
SW406	08 Jun 2023	4.76	15.2	-101.3	52,737	7.93
SW406	05 Sep 2023	4.76	15.2	-101.3	52,737	7.93
SW408	14 Jan 2020	6.5	26.5	-63.7	28,477	8.01
SW408	01 Apr 2020	4.93	24	-20.5	54,299	8.01
SW408	22 Jul 2020	5.75	15.8	18.4	18,263	
SW408	21 Sep 2020	5.03	20.4	-104.8	56,275	8.1
SW408	15 Dec 2020	4.85	19.8	77	53,676	7.97
SW408	17 Mar 2021	3.17	24.8	55.5	57,531	8.1
SW408	10 Jun 2021	6.24	18.1	37.9	53,402	8.92
SW408	31 Aug 2021	5.87	22.1	6.3	50,239	7.72
SW408	14 Jan 2022	3.43	24.9	35	53,794	8.11
SW408	16 Mar 2022	5.17	26.2	-39.7	58,134	8.19
SW408	07 Jun 2022	2.51	14.9	-4.5		7.43
SW408	07 Sep 2022	6.35	14.9	25	22,150	7.7
SW408	13 Dec 2022	4.68	19.4	69.9	54,992	8.08
SW408	14 Mar 2023	3.54	27	-42.1	53,008	7.16
SW408	08 Jun 2023	5.23	15.1	-93.3	52,646	7.92
SW408	05 Sep 2023	5.23	15.1	-93.3	52,646	7.92
SW410	14 Jan 2020	6.08	28.7	-98.5	32,170	8.17
SW410	02 Apr 2020	5.63	23.6	-255.1	53,657	7.77
SW410	21 Jul 2020	7.81	12.8	29.9	22,026	8.14
SW410	22 Sep 2020	4.06	19.5	-167.4	56,669	8.21
SW410	15 Dec 2020	4.3	20.4	38.3	55,888	8
SW410	17 Mar 2021	3.66	25.1	61.6	57,553	8.16
SW410	10 Jun 2021	5.89	18	60.4	53,555	8.62
SW410	31 Aug 2021	6.06	21.2	-88.1	51,621	7.91
SW410	14 Jan 2022	4.2	25	12.6	56,090	8.17
SW410	16 Mar 2022	4.75	25.5	-11.3	57,589	8.2
SW410	07 Jun 2022	3.65	16.8	3.5		7.8
SW410	06 Sep 2022	4.4	19.6	-3.8	47,561	7.89
SW410	13 Dec 2022	4.98	19.2	15.8	50,051	7.89
SW410	14 Mar 2023	5.77	27.1	-15.5	53,644	7.23
SW410	08 Jun 2023	5.94	15.4	-110.9	50,949	8.01
SW410	04 Sep 2023	5.94	15.4	-110.9	50,949	8.01
SW412	14 Jan 2020	6.52	26.5	-68.4	58,803	8.19
SW412	01 Apr 2020	6.2	23.7	-279.1	53,555	7.66
SW412	21 Jul 2020	6.45	14.6	34	43,445	8.14
SW412	22 Sep 2020	4.1	18.6	-181.7	56,982	8.07
SW412	15 Dec 2020	4.33	24.4	39.9	55,088	8.09
SW412	18 Mar 2021	4.02	24	42.6	55,929	8.09
SW412	10 Jun 2021	4.93	19.2	15.5	54,169	8.1
SW412	01 Sep 2021	7.19	16.5	97.5	27,903	8.09
SW412	14 Jan 2022	3.76	25.2	27.9	56,660	8.3
SW412	16 Mar 2022	4.41	25.2	43.7	57,345	8.14
SW412	07 Jun 2022	3.96	15.5	86.5		7.99
SW412	06 Sep 2022	6.69	17.4	-8.5	41,793	8.16

		Field Parameters				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
SW412	**14 Dec 2022**	4.21	22.8	-45.1	54,681	7.85
SW412	**15 Mar 2023**	5.53	26.1	82.2	56,280	8.27
SW412	**08 Jun 2023**	5.59	17.5	-103.3	54,092	8.02
SW412	**04 Sep 2023**	5.59	17.5	-103.3	54,092	8.02
SW414	**14 Jan 2020**	7.16	27.2	-65.2	30,498	8.08
SW414	**02 Apr 2020**	21.22	23.3	131.6	56,542	8.1
SW414	**21 Jul 2020**	6.03	15.5	42.3	44,857	8.09
SW414	**22 Sep 2020**	4.7	19.3	-128.2	56,965	8.16
SW414	**15 Dec 2020**	3.77	24.9	23.8	56,119	8.1
SW414	**18 Mar 2021**	3.08	26.2	67.8	57,773	8.06
SW414	**10 Jun 2021**	1.8	20.1	26.8	54,076	7.72
SW414	**01 Sep 2021**	6.65	16.8	90.4	52,110	8.04
SW414	**14 Jan 2022**	3.88	25.6	44.3	57,522	8.32
SW414	**16 Mar 2022**	4.26	25.9	37.8	57,465	8.17
SW414	**07 Jun 2022**	4.01	15.4	75.4		7.96
SW414	**06 Sep 2022**	6.79	17.7	2.2	42,074	8.17
SW414	**14 Dec 2022**	4.2	23.4	-92.7	55,357	7.89
SW414	**15 Mar 2023**	5.9	25.9	80.1	56,578	8.27
SW414	**08 Jun 2023**	6	17.8	-110.4	54,040	8.04
SW414	**04 Sep 2023**	6	17.8	-110.4	54,040	8.04
SW416	**14 Jan 2020**	6.18	28.1	-74.3	50,238	8.17
SW416	**02 Apr 2020**	5.86	23	139.4	53,672	8.12
SW416	**21 Jul 2020**	5.94	15.7	43.1	44,851	8.15
SW416	**22 Sep 2020**	4.57	21.6	-116.5	56,988	8.17
SW416	**15 Dec 2020**	4.14	24.9	19.9	56,798	8.14
SW416	**18 Mar 2021**	3.6	25	57.8	57,455	8.11
SW416	**10 Jun 2021**	5.27	17.7	64.5	53,503	8.56
SW416	**01 Sep 2021**	6.6	17.1	83.5	52,410	7.97
SW416	**14 Jan 2022**	3.96	25.2	25.7	57,135	8.34
SW416	**16 Mar 2022**	4.32	25.5	-12.9	57,889	8.17
SW416	**07 Jun 2022**	4.5	15.8	61.7		8.05
SW416	**06 Sep 2022**	6.45	18.7	67.5	42,875	8.15
SW416	**14 Dec 2022**	3.62	25.1	-46.1	57,973	7.99
SW416	**15 Mar 2023**	5.31	26.4	73	56,808	8.25
SW416	**08 Jun 2023**	6.01	17.7	-110.2	54,087	8.01
SW416	**04 Sep 2023**	6.01	17.7	-110.2	54,087	8.01

Monitoring Location	Date	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description
SD304	12/12/22	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, trace organics
SD304	13/03/23	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells, trace organics
SD304	7/06/23	0.3	Shovel, Trowel	Wet	SAND: Yellow, fine to medium grained, sub rounded
SD304	5/09/23	0.5	Shovel_Trowel	Wet	Sand
SD306	13/12/22	0.2	Shovel, Trowel	Wet	Cream Sand
SD306	14/03/23	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand
SD306	8/06/23	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded
SD306	4/09/23	0.4	Shovel_Trowel	Wet	Sand
SD307	13/12/22	0.2	Shovel, Trowel	Wet	Cream Sand
SD307	14/03/23	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand
SD307	8/06/23	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded
SD307	4/09/23	0.5	Shovel_Trowel	Wet	Beige sand
SD308	13/12/22	0.2	Shovel, Trowel	Wet	Cream Sand
SD308	14/03/23	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand
SD308	8/06/23	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded
SD308	4/09/23	0.5	Shovel_Trowel	Wet	Beige sand
SD314	13/12/22	0.5	Shovel, Trowel	Wet	Cream Sand
SD314	14/03/23	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand
SD314	8/06/23	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded
SD314	4/09/23	0.4	Shovel_Trowel	Wet	Sand
SD315	13/12/22	0.1	Shovel, Trowel	Wet	Cream Sand
SD315	14/03/23	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand
SD315	8/06/23	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded
SD315	4/09/23	0.5	Shovel_Trowel	Wet	Beige sand
SD316	13/12/22	0.1	Shovel, Trowel	Wet	Cream Sand
SD316	14/03/23	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand
SD316	8/06/23	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded
SD316	4/09/23	0.5	Shovel_Trowel	Wet	Beige sand
SD329	12/12/22	0.5	Shovel, Trowel	Wet	Grey sand
SD329	15/03/23	0.4	Shovel, Trowel	Wet	Sand, fine to coarse grained, beige, trace shells, trace organics
SD329	7/06/23	0.2	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded
SD329	11/09/23	0.2	Shovel_Trowel	Wet	Sand
SD330	12/12/22	0.5	Shovel, Trowel	Wet	Grey sand
SD330	15/03/23	0.4	Shovel, Trowel	Wet	Sand, fine to coarse grained, beige, trace shells, trace organics
SD330	7/06/23	0.2	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded
SD330	11/09/23	0.5	Shovel_Trowel	Wet	Sand
SD331	12/12/22	0.5	Shovel, Trowel	Wet	Grey sand
SD331	15/03/23	0.3	Shovel, Trowel	Wet	Sand, fine to coarse grained, beige to grey, trace shells, trace organics
SD331	7/06/23	0.2	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded
SD331	11/09/23	0.5	Shovel_Trowel	Wet	Sand
SD335	12/12/22	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, trace organics, beige
SD335	13/03/23	0.5	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, grey to beige, trace organics
SD335	7/06/23	0.5	Shovel, Trowel	Wet	SAND: yellow, fine to medium grained, sub rounded
SD335	5/09/23	0.4	Shovel_Trowel	Wet	Sand, fine to med grained, well graded, grey to beige, trace organics
SD340	12/12/22	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics
SD340	13/03/23	0.5	Shovel, Trowel	Wet	Sand, fine to med grained, grey to beige, trace organics
SD340	7/06/23	0.5	Shovel, Trowel	Wet	Grey sand
SD340	5/09/23	0.1	Shovel_Trowel	Wet	Sand, fine to med grained, beige to grey, trace organics
SD341	12/12/22	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, grey
SD341	13/03/23	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, beige, trace organics
SD341	7/06/23	0.5	Shovel, Trowel	Wet	SAND: Yellow, fine to medium grained, sub rounded
SD341	5/09/23	0.4	Shovel_Trowel	Wet	Sand, fine to med grained, beige to grey, trace organics
SD345	13/12/22	0.2	Shovel, Trowel	Wet	Grey Sand
SD345	14/03/23	0.2	Shovel, Trowel	Wet	Grey coarse sand
SD345	7/06/23	0.8	Shovel, Trowel	Wet	Grey sand trace seaweed
SD345	5/09/23	0.5	Shovel_Trowel	Wet	Grey sand
SD346	12/12/22	0.5	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics
SD346	14/03/23	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, beige to grey, trace organics
SD346	7/06/23	0.5	Shovel, Trowel	Wet	SAND: yellow, fine to medium grained, sub rounded
SD346	5/09/23	0.5	Shovel_Trowel	Wet	Sand
SD350	12/12/22	0.5	Shovel, Trowel	Wet	Yellow cream Sand
SD350	15/03/23	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand
SD350	7/06/23	0.5	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded
SD350	5/09/23	0.4	Shovel_Trowel	Wet	SAND, white yellow, fine to med grained
SD351	12/12/22	0.5	Shovel, Trowel	Wet	Cream Sand
SD351	15/03/23	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand
SD351	7/06/23	0.5	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded
SD351	5/09/23	0.4	Shovel_Trowel	Wet	SAND, white yellow, fine to med grained
SD352	12/12/22	0.5	Shovel, Trowel	Wet	Cream Sand
SD352	15/03/23	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand
SD352	7/06/23	0.5	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded
SD352	5/09/23	0.6	Shovel_Trowel	Wet	SAND, white yellow, fine to med grained
SD356	12/12/22	0.5	Shovel, Trowel	Wet	Grey sand
SD356	15/03/23	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, grey to beige, trace organics
SD356	7/06/23	0.2	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded
SD356	11/09/23	0.5	Shovel_Trowel	Wet	Sand
SD357	12/12/22	0.5	Shovel, Trowel	Wet	Grey sand
SD357	15/03/23	0.3	Shovel, Trowel	Wet	Sand, fine to coarse grained, well graded, beige, trace shells
SD357	7/06/23	0.5	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded
SD357	11/09/23	0.5	Shovel_Trowel	Wet	Sand
SD358	12/12/22	0.5	Shovel, Trowel	Wet	Grey sand
SD358	15/03/23	0.4	Shovel, Trowel	Wet	Sand, fine to coarse grained, beige, trace shells
SD358	7/06/23	0.2	Shovel, Trowel	Wet	Cream sand, fine to medium grained, sub rounded
SD358	11/09/23	0.2	Shovel_Trowel	Wet	Sand
SD362	12/12/22	0.5	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics
SD362	13/03/23	0.5	Shovel, Trowel	Wet	Sand, fine to med grained, trace organics
SD362	7/06/23	0.8	Shovel, Trowel	Wet	Grey sand
SD362	5/09/23	0.5	Shovel_Trowel	Wet	Sand, fine to med grained, grey beige, trace organics
SD363	12/12/22	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, grey,
SD363	13/03/23	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, trace organics, beige
SD363	7/06/23	0.5	Shovel, Trowel	Wet	SAND: Yellow, fine to medium grained, sub rounded
SD363	5/09/23	0.1	Shovel_Trowel	Wet	Sand, fine to med grained, grey, no odour, trace organics
SD364	12/12/22	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, beige
SD364	13/03/23	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, grey to beige, trace organics
SD364	7/06/23	0.3	Shovel, Trowel	Wet	SAND: Yellow, fine to medium grained, sub rounded
SD364	5/09/23	0.3	Shovel_Trowel	Wet	Sand, fine to med grained, beige to grey, trace organics
SD367	13/12/22	0.5	Shovel, Trowel	Wet	Grey sand. Seaweed presence
SD367	14/03/23	0.5	Shovel, Trowel	Wet	Grey coarse sand
SD367	7/06/23	1	Shovel, Trowel	Wet	Beige sand, trace seaweed
SD367	5/09/23	0.5	Shovel_Trowel	Wet	Grey sand
SD368	12/12/22	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, beige, trace organics
SD368	13/03/23	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, grey to beige, trace organics
SD368	7/06/23	0.5	Shovel, Trowel	Wet	SAND: yellow, rine to medium grained, sub rounded
SD368	5/09/23	0.2	Shovel_Trowel	Wet	Sand
SD369	13/12/22	0.2	Shovel, Trowel	Wet	Grey Sand
SD369	14/03/23	0.2	Shovel, Trowel	Wet	Grey coarse sand
SD369	7/06/23	0.8	Shovel, Trowel	Wet	Grey sand trace seaweed
SD369	5/09/23	0.8	Shovel_Trowel	Wet	Grey sand
SD374	13/12/22	0.4	Shovel, Trowel	Wet	Sand, medium to coarse grained, well graded, beige, trace shells
SD374	14/03/23	0.5	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells
SD374	6/06/23	0.3	Shovel, Trowel	Wet	Sand: yellow mottled white, medium to coarse grained, sub rounded to sub anuglar.
SD374	4/09/23	0.2	Shovel_Trowel	Wet	Sand
SD375	13/12/22	0.5	Shovel, Trowel	Wet	Sand, fine to coarse grained, beige, trace shells
SD375	14/03/23	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, beige, trace shells
SD375	6/06/23	0.3	Shovel, Trowel	Wet	SAND: yellow mottled white, medium to coarse grained, sub-rounded to sub angular
SD375	4/09/23	0.5	Shovel_Trowel	Wet	Sand
SD378	13/12/22	0.3	Shovel, Trowel	Wet	Sand, medium to coarse grained, well graded, beige, trace organics
SD378	14/03/23	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells, trace organics
SD378	6/06/23	0.3	Shovel, Trowel	Wet	SAND: yellow mottled white, mediym to coarse grained, sub-rounded to sub-angular
SD378	4/09/23	0.2	Shovel_Trowel	Wet	Sand
SD380	12/12/22	0.5	Shovel, Trowel	Wet	Cream Sand
SD380	15/03/23	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand
SD380	7/06/23	0.5	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded
SD380	5/09/23	0.3	Shovel_Trowel	Wet	SAND, white yellow, fine to med grained
SD381	12/12/22	0.5	Shovel, Trowel	Wet	Cream Sand
SD381	15/03/23	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand
SD381	7/06/23	0.5	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded
SD381	5/09/23	0.7	Shovel_Trowel	Wet	SAND, white yellow, fine to med grained
SD401	12/12/22	0.5	Shovel, Trowel	Wet	Cream Sand
SD401	15/03/23	0.5	Shovel, Trowel	Wet	Yellow fine to med grained sand
SD401	7/06/23	0.5	Shovel, Trowel	Dry	Cream sand, fine to medium grained, sub rounded
SD401	5/09/23	0.5	Shovel_Trowel	Wet	SAND, white yellow, fine to med grained
SD405	13/12/22	0.2	Shovel, Trowel	Wet	Grey Sand
SD405	14/03/23	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells
SD405	8/06/23	0.8	Shovel, Trowel	Wet	Beige sand
SD405	5/09/23	0.3	Shovel_Trowel	Wet	SAND, white and grey, fine to med grain, wet
SD407	13/12/22	0.2	Shovel, Trowel	Wet	Grey Sand
SD407	14/03/23	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells
SD407	8/06/23	0.5	Shovel, Trowel	Wet	Beige sand
SD407	5/09/23	0.4	Shovel_Trowel	Wet	White SAND, fine to med grain, wet
SD409	13/12/22	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, grey, trace shells
SD409	14/03/23	0.4	Shovel, Trowel	Wet	Sand, fine to med grained, trace organics, beige, trace shells
SD409	8/06/23	0.5	Shovel, Trowel	Wet	Beige sand
SD409	4/09/23	0.8	Shovel_Trowel	Wet	Grey sand
SD411	14/12/22	0.1	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics
SD411	15/03/23	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, beige to grey, trace shells
SD411	8/06/23	0.8	Shovel, Trowel	Wet	SAND:Yellow fine to mediun grained, sub rounded
SD411	4/09/23	0.8	Shovel_Trowel	Wet	Beige coarse sand
SD413	14/12/22	0.1	Shovel, Trowel	Wet	Sand, fine to med grained, grey, trace shells
SD413	15/03/23	0.6	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells, trace organics
SD413	8/06/23	0.8	Shovel, Trowel	Wet	SAND: yellow, fine to medium grained, sub rounded
SD413	4/09/23	0.5	Shovel_Trowel	Wet	Beige coarse sand
SD415	14/12/22	0.1	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics, trace shells
SD415	15/03/23	0.1	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells
SD415	8/06/23	0.8	Shovel, Trowel	Wet	SAND: yellow, fine to medium grained, sub rounded
SD415	4/09/23	0.5	Shovel_Trowel	Wet	Beige coarse sand

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MW109	3/08/2017	4.12	0.326	sampled at 5.12
MW109	20/09/2017	4.13	0.316	MW109-S
MW109	20/09/2017	4.13	0.316	MW109-D
MW109	18/10/2017	4.105	0.341	MW109-D
MW109	18/10/2017	4.105	0.341	MW109-S
MW109	16/11/2017	4.18	0.266	
MW109	16/11/2017	4.18	0.266	
MW109	6/12/2017	4.205	0.241	MW109-S
MW109	6/12/2017	4.205	0.241	MW109-D
MW109	18/01/2018	4.12	0.326	MW109-S
MW109	18/01/2018	4.12	0.326	MW109-D
MW109	16/12/2019	4.195	0.251	
MW109	30/03/2020	4.101	0.345	
MW109	15/07/2020	3.885	0.561	
MW109	21/09/2020	4.151	0.295	
MW109	21/09/2020	4.151	0.295	
MW109	14/12/2020	4.115	0.331	
MW109	16/03/2021	4.022	0.424	Clear
MW109	8/06/2021	4.03	0.416	
MW109	30/08/2021	4.12	0.326	
MW109	16/11/2021	4.12	0.326	Roots.
MW109	10/01/2022	5.5		Dry
MW109	14/03/2022	4.02	0.426	
MW109	7/06/2022	3.99	0.456	
MW109	5/09/2022	4.015	0.431	
MW109	12/12/22	4.23	0.216	
MW109	13/03/2023	4.12	0.326	
MW109	6/06/2023	3.87	0.576	
MW109	14/07/2023	4.057	0.389	flush mount with HS
MW109	5/09/2023	4.09	0.356	
MW112	3/08/2017	3.47	0.503	sampled at 5.86
MW112	20/09/2017	3.51	0.463	MW112-S
MW112	20/09/2017	3.51	0.463	MW112-D
MW112	18/10/2017	3.46	0.513	MW112-D
MW112	18/10/2017	3.46	0.513	MW112-S
MW112	16/11/2017	3.53	0.443	
MW112	16/11/2017	3.53	0.443	
MW112	6/12/2017	3.525	0.448	MW112-S
MW112	6/12/2017	3.525	0.448	MW112-D
MW112	18/01/2018	3.475	0.498	MW112-S
MW112	18/01/2018	3.475	0.498	MW112-D
MW112	8/01/2020	3.61	0.363	
MW112	30/03/2020	3.46	0.513	
MW112	15/07/2020	3.315	0.658	
MW112	21/09/2020	3.456	0.517	
MW112	21/09/2020	3.456	0.517	
MW112	14/12/2020	3.46	0.513	
MW112	16/03/2021	3.435	0.538	Clear,Green
MW112	8/06/2021	3.96	0.013	
MW112	30/08/2021	3.46	0.513	
MW112	10/01/2022	3.5	0.473	
MW112	14/03/2022	3.39	0.583	
MW112	7/06/2022	3.385	0.588	
MW112	5/09/2022	3.355	0.618	
MW112	12/12/22	3.55	0.423	
MW112	13/03/2023	3.485	0.488	
MW112	6/06/2023	3.37	0.603	
MW112	14/07/2023	3.423	0.55	flush mount with HS
MW112	5/09/2023	3.45	0.523	
MW120	3/08/2017	4.04	0.369	sampled at 5.04
MW120	20/09/2017	4.065	0.344	MW120-S
MW120	20/09/2017	4.065	0.344	MW120-D
MW120	18/10/2017	4.02	0.389	MW120-D
MW120	18/10/2017	4.02	0.389	MW120-S
MW120	16/11/2017	4.12	0.289	
MW120	16/11/2017	4.12	0.289	
MW120	6/12/2017	4.12	0.289	MW120-S
MW120	6/12/2017	4.12	0.289	MW120-D
MW120	18/01/2018	4.05	0.359	MW120-S
MW120	18/01/2018	4.05	0.359	MW120-D
MW120	4/11/2019	4.195	0.214	
MW120	16/12/2019	4.13	0.279	
MW120	30/03/2020	4.024	0.385	
MW120	15/07/2020	3.82	0.589	
MW120	21/09/2020	5.5		Dry
MW120	21/09/2020	5.5		Dry
MW120	14/12/2020	4.04	0.369	
MW120	16/03/2021	3.42	0.989	Cloudy
MW120	8/06/2021	3.96	0.449	
MW120	30/08/2021	4.06	0.349	
MW120	15/11/2021	4.036	0.373	
MW120	16/11/2021	4.06	0.349	
MW120	10/01/2022	3.34	1.069	
MW120	14/03/2022	3.946	0.463	
MW120	7/06/2022	3.955	0.454	
MW120	5/09/2022	3.947	0.462	
MW120	12/12/22	4.15	0.259	
MW120	13/03/2023	4.075	0.334	
MW120	6/06/2023	3.82	0.589	
MW120	5/09/2023	4.02	0.389	
MW121	3/08/2017	3.315	0.385	
MW121	20/09/2017	3.365	0.335	MW121-S

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW121	20/09/2017	3.365	0.335	MW121-D
MW121	18/10/2017	3.31	0.39	MW121-D
MW121	18/10/2017	3.31	0.39	MW121-S
MW121	16/11/2017	3.405	0.295	
MW121	16/11/2017	3.405	0.295	
MW121	6/12/2017	3.39	0.31	MW121-S
MW121	6/12/2017	3.39	0.31	MW121-D
MW121	18/01/2018	3.305	0.395	MW121-S
MW121	18/01/2018	3.305	0.395	MW121-D
MW121	5/11/2019	3.47	0.23	
MW121	16/12/2019	3.42	0.28	
MW121	30/03/2020	4.29	-0.59	
MW121	15/07/2020	3.165	0.535	
MW121	21/09/2020	3.356	0.344	
MW121	21/09/2020	3.356	0.344	
MW121	14/12/2020	3.4	0.3	
MW121	16/03/2021	6.22	-2.52	Cloudy
MW121	8/06/2021	3.25	0.45	
MW121	30/08/2021	4.275	-0.575	
MW121	15/11/2021	3.33	0.37	
MW121	10/01/2022	3.36	0.34	
MW121	14/03/2022	3.25	0.45	
MW121	7/06/2022	3.235	0.465	
MW121	5/09/2022	3.225	0.475	Hydrasleeve broke during recovery
MW121	12/12/22	3.42	0.28	Bore nearly dry
MW121	13/03/2023	3.36	0.34	
MW121	6/06/2023	5.7		No SWL recorded
MW121	5/09/2023	3.31	0.39	
MW123	3/08/2017	6.225	0.395	sampled at 7.26
MW123	20/09/2017	6.34	0.28	MW123-S
MW123	20/09/2017	6.34	0.28	MW123-D
MW123	18/10/2017	6.295	0.325	MW123-D, MAINS WATER LEAK, BEING REPAIRED TODAY
MW123	18/10/2017	6.295	0.325	MW123-S
MW123	16/11/2017	6.35	0.27	
MW123	16/11/2017	6.35	0.27	
MW123	6/12/2017	6.335	0.285	MW123-S
MW123	6/12/2017	6.335	0.285	MW123-D
MW123	18/01/2018	6.273	0.347	MW123-S
MW123	18/01/2018	6.273	0.347	MW123-D
MW123	16/12/2019	6.39	0.23	QC101 201 taken
MW123	30/03/2020	8		Dry
MW123	15/07/2020	8		DRY
MW123	21/09/2020	8		
MW123	21/09/2020	8		
MW123	14/12/2020	6.27	0.35	
MW123	16/03/2021	7.34	-0.72	Cloudy
MW123	8/06/2021	6.18	0.44	
MW123	30/08/2021	6.265	0.355	
MW123	15/11/2021	6.321	0.299	
MW123	16/11/2021	6.265	0.355	Hand bailed. 3 readings taken. Slight hydrocarbon odour
MW123	10/01/2022	6.27	0.35	
MW123	14/03/2022	6.23	0.39	
MW123	7/06/2022	6.18	0.44	
MW123	5/09/2022	6.17	0.45	
MW123	12/12/22	6.335	0.285	
MW123	13/03/2023	6.305	0.315	
MW123	6/06/2023	6.125	0.495	
MW123	5/09/2023	6.28	0.34	
MW124	3/08/2017	1.745	0.154	
MW124	20/09/2017	1.716	0.183	MW124-S, H2S ODOUR, GREY STAINING
MW124	20/09/2017	1.716	0.183	MW124-D, H2S ODOUR, GREY STAINING
MW124	18/10/2017	1.76	0.139	MW124-D
MW124	18/10/2017	1.76	0.139	MW124-S
MW124	16/11/2017	1.874	0.025	Slight H2S odour, no staining
MW124	6/12/2017	1.969	-0.07	MW124-D, sl H2S odour, Sl tannin staining
MW124	6/12/2017	1.972	-0.073	MW124-S, sl tannin appearance sl H2S odour
MW124	18/01/2018	1.76	0.139	MW124-S, sl tannin appearance sl H2S odour
MW124	18/01/2018	1.76	0.139	MW124-D, sl H2S odour, Sl tannin staining
MW124	9/01/2020	1.992	-0.093	
MW124	30/03/2020	1.676	0.223	
MW124	15/07/2020	1.46	0.439	
MW124	22/09/2020	1.893	0.006	
MW124	22/09/2020	1.893	0.006	
MW124	14/12/2020	1.79	0.109	
MW124	15/03/2021	1.635	0.264	Clear
MW124	8/06/2021	1.63	0.269	
MW124	30/08/2021	1.78	0.119	
MW124	16/11/2021	1.78	0.119	
MW124	10/01/2022	1.94	-0.041	
MW124	14/03/2022	1.71	0.189	
MW124	7/06/2022	1.625	0.274	
MW124	5/09/2022	1.6	0.299	
MW124	12/12/22	1.97	-0.071	
MW124	13/03/2023	1.85	0.049	
MW124	7/06/2023	1.17	0.729	
MW124	5/09/2023	1.77	0.129	
MW125	3/08/2017	1.722	0.16	sampled at 2
MW125	20/09/2017	1.738	0.144	MW125-S, H2S ODOUR, NO STAINING
MW125	20/09/2017	1.738	0.144	MW125-D, H2S ODOUR, NO STAINING
MW125	18/10/2017	1.73	0.152	MW125-D, v slight organic odour, no sheen
MW125	18/10/2017	1.73	0.152	MW125-S, v slight organic odour, no sheen
MW125	16/11/2017	1.858	0.024	H2S ODOUR
MW125	16/11/2017	1.858	0.024	H2S ODOUR

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MW125	6/12/2017	1.918	-0.036	MW125-S, SL H2S ODOUR, SL TANNIN APPEARANCE
MW125	6/12/2017	1.921	-0.039	MW125-D, SL H2S ODOUR, SL TANNIN APPEARANCE
MW125	18/01/2018	1.722	0.16	MW125-S, SL H2S ODOUR, SL TANNIN APPEARANCE
MW125	18/01/2018	1.722	0.16	MW125-D, SL H2S ODOUR, SL TANNIN APPEARANCE
MW125	9/01/2020	1.97	-0.088	
MW125	30/03/2020	1.82	0.062	
MW125	15/07/2020	1.44	0.442	
MW125	22/09/2020	1.868	0.014	
MW125	22/09/2020	1.868	0.014	
MW125	14/12/2020	1.76	0.122	
MW125	15/03/2021	1.73	0.152	Clear
MW125	8/06/2021	1.63	0.252	
MW125	30/08/2021	1.77	0.112	
MW125	16/11/2021	1.77	0.112	
MW125	10/01/2022	1.9	-0.018	
MW125	14/03/2022	1.685	0.197	
MW125	7/06/2022	1.63	0.252	
MW125	5/09/2022	1.58	0.302	
MW125	12/12/22	1.965	-0.083	
MW125	13/03/2023	1.79	0.092	
MW125	7/06/2023	1.26	0.622	
MW125	5/09/2023	1.75	0.132	
MW126	3/08/2017	1.785	0.163	sampled at 2
MW126	20/09/2017	1.818	0.13	MW126-S, H2S ODOUR, GREY STAINING
MW126	20/09/2017	1.818	0.13	MW126-D, H2S ODOUR, GREY STAINING
MW126	18/10/2017	1.77	0.178	MW126-D, slight organic odour, no sheen
MW126	18/10/2017	1.77	0.178	MW126-S, slight organic odour, no sheen
MW126	16/11/2017	1.926	0.022	H2S odour, Sl Grey Staining
MW126	6/12/2017	1.922	0.026	MW126-S, H2S ODOUR, SL TANNIN APPEARANCE
MW126	6/12/2017	1.931	0.017	MW126-D, H2S ODOUR, SL TANNIN AND GREY STAINING
MW126	18/01/2018	1.74	0.208	MW126-S, H2S ODOUR, SL TANNIN APPEARANCE
MW126	18/01/2018	1.74	0.208	MW126-D, H2S ODOUR, SL TANNIN AND GREY STAINING
MW126	8/01/2020	1.73	0.218	
MW126	31/03/2020	1.866	0.082	
MW126	15/07/2020	1.54	0.408	
MW126	22/09/2020	1.913	0.035	
MW126	22/09/2020	1.913	0.035	
MW126	14/12/2020	1.79	0.158	
MW126	15/03/2021	1.825	0.123	Clear
MW126	8/06/2021	1.67	0.278	
MW126	30/08/2021	1.79	0.158	
MW126	16/11/2021	1.79	0.158	
MW126	10/01/2022	1.9	0.048	Slight sulfur odour
MW126	14/03/2022	1.74	0.208	
MW126	7/06/2022	1.71	0.238	
MW126	5/09/2022	1.64	0.308	
MW126	12/12/22	1.92	0.028	
MW126	13/03/2023	1.85	0.098	
MW126	7/06/2023	1.26	0.688	
MW126	5/09/2023	1.8	0.148	
MW127	3/08/2017	1.6	0.171	sampled at 2
MW127	20/09/2017	1.639	0.132	MW127-S
MW127	20/09/2017	1.639	0.132	MW127-D
MW127	18/10/2017	1.59	0.181	MW127-D, slight organic odour, no sheen
MW127	18/10/2017	1.59	0.181	MW127-S, slight organic odour, no sheen
MW127	16/11/2017	1.741	0.03	H2S odour, grey staining probes + Bucket
MW127	16/11/2017	1.741	0.03	H2S odour, grey staining probes + Bucket
MW127	6/12/2017	1.717	0.054	MW127-S, H2S ODOUR SL TANNIN
MW127	6/12/2017	1.731	0.04	MW127-D, H2S ODOUR, GREY STAIN, SL TANNIN
MW127	18/01/2018	1.565	0.206	MW127-S, H2S ODOUR SL TANNIN
MW127	18/01/2018	1.565	0.206	MW127-D, H2S ODOUR, GREY STAIN, SL TANNIN
MW127	8/01/2020	1.77	0.001	
MW127	31/03/2020	1.505	0.266	
MW127	15/07/2020	1.36	0.411	
MW127	22/09/2020	1.721	0.05	
MW127	22/09/2020	1.721	0.05	
MW127	14/12/2020	1.615	0.156	
MW127	15/03/2021	1.63	0.141	Clear
MW127	8/06/2021	1.505	0.266	
MW127	30/08/2021	1.59	0.181	
MW127	16/11/2021	1.59	0.181	
MW127	10/01/2022	1.81	-0.039	Slight sulfur odour
MW127	14/03/2022	1.71	0.061	
MW127	7/06/2022	1.51	0.261	
MW127	5/09/2022	1.48	0.291	
MW127	12/12/22	1.76	0.011	
MW127	13/03/2023	1.72	0.051	
MW127	7/06/2023	1.26	0.511	
MW127	5/09/2023	1.63	0.141	
MW128	3/08/2017	4.185	0.352	sampled at 5.19
MW128	20/09/2017	4.305	0.232	MW128-S
MW128	20/09/2017	4.305	0.232	MW128-D
MW128	18/10/2017	4.27	0.267	MW128-D, NO ODOUR&SHEEN
MW128	18/10/2017	4.27	0.267	MW128-S, NO ODOUR&SHEEN
MW128	16/11/2017	4.333	0.204	no o/s
MW128	16/11/2017	4.333	0.204	no o/s
MW128	6/12/2017	4.314	0.223	MW128-S, NO O/S
MW128	6/12/2017	4.317	0.22	MW128-D, NO O/S
MW128	18/01/2018	4.188	0.349	MW128-S, NO O/S
MW128	18/01/2018	4.188	0.349	MW128-D, NO O/S
MW128	21/11/2019	5.5		Dry
MW128	16/12/2019	5.5		Dry

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW128	30/03/2020	5.5		Dry
MW128	15/07/2020	5.5		DRY
MW128	21/09/2020	5.5		
MW128	21/09/2020	5.5		
MW128	14/12/2020	5.5		DRY
MW128	16/03/2021	5.5		DRY
MW128	8/06/2021	3.69		Dry at 3.7
MW128	30/08/2021	5.5		Dry
MW128	16/11/2021	5.5		Dry
MW128	10/01/2022	5.5		Dry
MW128	14/03/2022	5.5		
MW128	7/06/2022	4.31	0.227	Unblocked
MW128	5/09/2022	4.305	0.232	Insuficient water column for hydrasleeve
MW128	12/12/22	4.33	0.207	
MW128	13/03/2023	5.5		
MW128	7/06/2023	4.08	0.457	
MW128	5/09/2023	4.3	0.237	
MW139	1/08/2017	1.8	0.473	sampled at 2.1
MW139	19/09/2017	2.09	0.183	MW139-S
MW139	19/09/2017	2.09	0.183	MW139-D
MW139	17/10/2017	2.075	0.198	MW139-D TRACE SUSPENDED SOLIDS AT BEGINNING - CLEARED
MW139	17/10/2017	2.075	0.198	MW139-S
MW139	20/11/2017	2.06	0.213	no o/s
MW139	20/11/2017	2.06	0.213	no o/s
MW139	4/12/2017	2.14	0.133	MW139-S
MW139	4/12/2017	2.14	0.133	MW139-D
MW139	17/01/2018	1.795	0.478	MW139-S
MW139	17/01/2018	1.795	0.478	MW139-D
MW139	15/11/2019	2.178	0.095	
MW139	8/01/2020	2.22	0.053	
MW139	30/03/2020	2.034	0.239	
MW139	20/07/2020	1.82	0.453	
MW139	22/09/2020	2.041	0.232	
MW139	22/09/2020	2.041	0.232	
MW139	14/12/2020	2.05	0.223	
MW139	16/03/2021	2	0.273	Clear
MW139	8/06/2021	1.884	0.389	
MW139	31/08/2021	1.975	0.298	
MW139	18/11/2021	2.041	0.232	
MW139	10/01/2022	2.1	0.173	
MW139	15/03/2022	2.004	0.269	
MW139	8/06/2022	1.89	0.383	
MW139	5/09/2022	1.895	0.378	
MW139	14/11/2022	5		Groundwater depth measurements were not successfully captured in the field
MW139	12/12/22	2.095	0.178	
MW139	15/03/2023	2.108	0.165	
MW139	7/06/2023	1.789	0.484	
MW139	11/09/2023	2.06	0.213	
MW141	1/08/2017	2.675	0.35	sampled at 3.68
MW141	19/09/2017	2.84	0.185	MW141-S
MW141	19/09/2017	2.84	0.185	MW141-D
MW141	17/10/2017	2.7	0.325	MW141-D, SLIGHT ORGANIC ODOUR, NO SHEEN
MW141	17/10/2017	2.7	0.325	MW141-S
MW141	20/11/2017	2.83	0.195	no o/s, no staining
MW141	20/11/2017	2.83	0.195	no o/s, no staining
MW141	4/12/2017	2.9	0.125	MW141-S
MW141	4/12/2017	2.9	0.125	MW141-D
MW141	17/01/2018	2.74	0.285	MW141-S
MW141	17/01/2018	2.74	0.285	MW141-D
MW141	15/11/2019	2.946	0.079	
MW141	8/01/2020	2.98	0.045	
MW141	30/03/2020	2.806	0.219	
MW141	20/07/2020	2.655	0.37	
MW141	23/09/2020	2.859	0.166	
MW141	23/09/2020	2.859	0.166	
MW141	14/12/2020	2.78	0.245	
MW141	16/03/2021	2.76	0.265	Cloudy, sulfur odour
MW141	8/06/2021	1.673	1.352	
MW141	31/08/2021	2.725	0.3	
MW141	18/11/2021	2.826	0.199	
MW141	10/01/2022	2.89	0.135	
MW141	15/03/2022	2.726	0.299	
MW141	8/06/2022	2.66	0.365	
MW141	5/09/2022	2.66	0.365	
MW141	15/11/2022	5		Groundwater depth measurements were not successfully captured in the field
MW141	12/12/22	2.92	0.105	
MW141	15/03/2023	2.899	0.126	
MW141	7/06/2023	2.464	0.561	
MW141	11/09/2023	2.6	0.425	
MW142	1/08/2017	2.28	0.293	sampled at 2.5
MW142	19/09/2017	2.397	0.176	MW142-S
MW142	19/09/2017	2.397	0.176	MW142-D
MW142	17/10/2017	2.15	0.423	MW142-S NO O/S
MW142	17/10/2017	2.15	0.423	MW142-D NO O/S
MW142	20/11/2017	2.434	0.139	no o/s
MW142	20/11/2017	2.434	0.139	no o/s
MW142	4/12/2017	2.478	0.095	MW142-S, NO O/S
MW142	4/12/2017	2.478	0.095	MW142-D, NO O/S
MW142	17/01/2018	2.308	0.265	MW142-S, NO O/S
MW142	17/01/2018	2.308	0.265	MW142-D, NO O/S
MW142	15/11/2019	2.539	0.034	
MW142	8/01/2020	2.13	0.443	
MW142	30/03/2020	2.391	0.182	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW142	20/07/2020	2.18	0.393	
MW142	23/09/2020	2.463	0.11	
MW142	23/09/2020	2.463	0.11	
MW142	14/12/2020	2.36	0.213	
MW142	16/03/2021	2.32	0.253	Yellow
MW142	8/06/2021	2.275	0.298	
MW142	30/08/2021	2.338	0.235	
MW142	10/01/2022	2.49	0.083	
MW142	15/03/2022	2.275	0.298	
MW142	8/06/2022	2.22	0.353	
MW142	5/09/2022	2.295	0.278	Bore now 50cm from edge of sand dune
MW142	12/12/22	2.55	0.023	
MW142	15/03/2023	2.47	0.103	
MW142	7/06/2023	2.01	0.563	
MW142	11/09/2023	2.37	0.203	
MW147	1/08/2017	3.05	0.373	sampled at 3.
MW147	19/09/2017	3.205	0.218	MW147-S
MW147	19/09/2017	3.205	0.218	MW147-D
MW147	17/10/2017	3.045	0.378	MW147-D, ROOT FRAGS IN START UP
MW147	17/10/2017	3.045	0.378	MW147-S, ROOT FRAGS IN START UP
MW147	20/11/2017	3.19	0.233	some suspended solids @ 1min, cleared during purge, no o/s, grey staining on probes
MW147	20/11/2017	3.19	0.233	NO O/S, GREY STAIN ON PROBES
MW147	4/12/2017	3.27	0.153	MW147-S
MW147	4/12/2017	3.27	0.153	MW147-D
MW147	17/01/2018	3.125	0.298	MW147-S
MW147	17/01/2018	3.125	0.298	MW147-D
MW147	15/11/2019	5.2		Dry
MW147	8/01/2020	5.2		Dry
MW147	30/03/2020	5.2		Bore dry - no sample able to be taken
MW147	20/07/2020	2.91	0.513	
MW147	23/09/2020	5.2		
MW147	23/09/2020	5.2		
MW147	14/12/2020	5.2		Dry
MW147	16/03/2021	5.2		Dry
MW147	8/06/2021	5.2		DRY
MW147	30/08/2021	5.2		Dry
MW147	18/11/2021	3.197	0.226	
MW147	10/01/2022	5.2		Dry, difficult to access due to vegetation overgrown
MW147	15/03/2022	5.2		
MW147	8/06/2022	5.2		Dry/blocked at 2.96m
MW147	5/09/2022	5.2		Blocked at 2.5m
MW147	14/11/2022	5.2		Root blockage at 3.440 m bTOC unable to unblock.
MW147	12/12/22			Blocked and inaccessible in dense bush
MW147	15/03/2023	3.071	0.352	
MW147	7/06/2023	2.895	0.528	
MW147	11/09/2023	3.2	0.223	
MW149	1/08/2017	2.02	0.283	sampled at 2.2
MW149	19/09/2017	2.087	0.216	MW149-S
MW149	19/09/2017	2.087	0.216	MW149-D
MW149	17/10/2017	1.731	0.572	MW149-D, NO O/S
MW149	17/10/2017	1.731	0.572	MW149-S, NO O/S
MW149	20/11/2017	2.171	0.132	
MW149	20/11/2017	2.171	0.132	
MW149	4/12/2017	2.223	0.08	MW149-S, NO O/S
MW149	4/12/2017	2.217	0.086	MW149-D, NO O/S
MW149	17/01/2018	2.047	0.256	MW149-S, NO O/S
MW149	17/01/2018	2.047	0.256	MW149-D, NO O/S
MW149	15/11/2019	2.266	0.037	
MW149	8/01/2020	2.29	0.013	
MW149	30/03/2020	2.094	0.209	
MW149	20/07/2020	1.87	0.433	
MW149	23/09/2020	2.2	0.103	
MW149	23/09/2020	2.2	0.103	
MW149	14/12/2020	2.08	0.223	
MW149	16/03/2021	2.06	0.243	Clear
MW149	8/06/2021	1.975	0.328	
MW149	30/08/2021	2.066	0.237	
MW149	18/11/2021	2.173	0.13	
MW149	10/01/2022	2.21	0.093	
MW149	15/03/2022	2.026	0.277	
MW149	8/06/2022	1.91	0.393	
MW149	5/09/2022	2.02	0.283	Monument below bore casing due to beach erosion.
MW149	15/11/2022	4		Groundwater depth measurements were not successfully captured in the field
MW149	12/12/22	2.3	0.003	
MW149	15/03/2023	2.056	0.247	
MW149	7/06/2023	1.76	0.543	
MW149	11/09/2023	2.06	0.243	
MW158	7/08/2017	14.16	0.381	sampled at 15.16
MW158	1/11/2019	14.26	0.281	
MW158	8/01/2020	14.34	0.201	
MW158	31/03/2020	14.18	0.361	
MW158	21/07/2020	14.125	0.416	
MW158	21/09/2020	14.123	0.418	
MW158	21/09/2020	14.123	0.418	
MW158	14/12/2020	14.14	0.401	
MW158	15/03/2021	15.82		Clear
MW158	10/06/2021	13.991	0.55	
MW158	30/08/2021	14.58	-0.039	
MW158	16/11/2021	14.58	-0.039	
MW158	10/01/2022	15.82		Dry unable to sample
MW158	15/03/2022	14.082	0.459	
MW158	7/06/2022	13.908	0.633	
MW158	5/09/2022	14.121	0.42	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW158	12/12/22	14.31	0.231	
MW158	13/03/2023	14.252	0.289	
MW158	6/06/2023	13.98	0.561	
MW158	14/07/2023	13.137	1.404	silver monument, casing stained yellow wit slits in top of casing, poor condition. The well is located in the bushes
MW158	4/09/2023	14.18	0.361	
MW161	7/08/2017	16.585	0.64	sampled at 18.16
MW161	18/09/2017	16.775	0.45	
MW161	19/10/2017	16.725	0.5	new pump used
MW161	15/11/2017	16.765	0.46	
MW161	7/12/2017	16.76	0.465	
MW161	16/01/2018	16.775	0.45	
MW161	1/11/2019	16.722	0.503	
MW161	8/01/2020	16.97	0.255	
MW161	21/07/2020	16.62	0.605	
MW161	21/09/2020	16.528	0.697	
MW161	21/09/2020	16.528	0.697	
MW161	14/12/2020	16.77	0.455	
MW161	15/03/2021	16.7	0.525	Clear,Cloudy
MW161	10/06/2021	16.655	0.57	
MW161	30/08/2021	14.6	2.625	
MW161	15/11/2021	16.743	0.482	
MW161	16/11/2021	14.6	2.625	
MW161	10/01/2022	16.78	0.445	
MW161	15/03/2022	12.616	4.609	
MW161	5/05/2022	16.659	0.566	Unable to get total depth as well is blocked by redeployed hydrasleeve
MW161	7/06/2022	16.637	0.588	
MW161	5/09/2022	16.669	0.556	
MW161	15/11/2022	16.845	0.38	
MW161	12/12/22	16.839	0.386	
MW161	13/03/2023	16.807	0.418	
MW161	9/05/2023	16.774	0.451	
MW161	6/06/2023	16.42	0.805	
MW161	14/07/2023	16.673	0.552	
MW161	4/09/2023	16.706	0.519	
MW166	7/08/2017	11.22	0.67	sampled at 12.22
MW166	18/09/2017	11.345	0.545	
MW166	19/10/2017	11.315	0.575	
MW166	15/11/2017	11.37	0.52	
MW166	7/12/2017	11.38	0.51	
MW166	16/01/2018	11.38	0.51	
MW166	1/11/2019	11.398	0.492	
MW166	8/01/2020	11.42	0.47	
MW166	1/04/2020	11.26	0.63	
MW166	21/07/2020	11.195	0.695	
MW166	22/09/2020	11.294	0.596	
MW166	22/09/2020	11.294	0.596	
MW166	14/12/2020	11.28	0.61	
MW166	15/03/2021	11.295	0.595	
MW166	10/06/2021	12.09	-0.2	
MW166	30/08/2021	11.75	0.14	
MW166	15/11/2021	11.695	0.195	
MW166	16/11/2021	11.75	0.14	
MW166	10/01/2022	11.33	0.56	
MW166	15/03/2022	11.202	0.688	
MW166	5/05/2022	11.268	0.622	
MW166	7/06/2022	11.193	0.697	
MW166	5/09/2022	11.275	0.615	
MW166	15/11/2022	11.436	0.454	
MW166	12/12/22	11.422	0.468	
MW166	13/03/2023	11.313	0.577	
MW166	9/05/2023	11.215	0.675	
MW166	6/06/2023	11.03	0.86	
MW166	14/07/2023	11.205	0.685	
MW166	4/09/2023	11.235	0.655	
MW171	7/08/2017	28.68	0.558	sampled at 29.7
MW171	18/09/2017	28.855	0.383	
MW171	19/10/2017	28.82	0.418	
MW171	15/11/2017	28.86	0.378	
MW171	7/12/2017	28.87	0.368	
MW171	16/01/2018	28.88	0.358	
MW171	30/10/2019	28.924	0.314	
MW171	1/04/2020	28.55	0.688	
MW171	21/07/2020	28.48	0.758	
MW171	22/09/2020	31.5	-2.262	
MW171	22/09/2020	31.5	-2.262	
MW171	14/12/2020	28.55	0.688	
MW171	15/03/2021	28.55	0.688	Cloudy, sulfur odour
MW171	10/06/2021	28.392	0.846	
MW171	30/08/2021	28.6	0.638	
MW171	15/11/2021	28.789	0.449	
MW171	16/11/2021	28.6	0.638	
MW171	10/01/2022	28.64	0.598	
MW171	15/03/2022	28.451	0.787	
MW171	5/05/2022	28.53	0.708	Unable to get total depth as well is blocked by redeployed hydrasleeve
MW171	7/06/2022	28.341	0.897	
MW171	5/09/2022	28.538	0.7	
MW171	15/11/2022	28.91	0.328	LNAPL at observed 3.641
MW171	12/12/22	28.694	0.544	
MW171	13/03/2023	28.325	0.913	
MW171	9/05/2023	28.517	0.721	Monument, Good condition, Yellow stick up
MW171	6/06/2023	28.58	0.658	
MW171	14/07/2023	28.72	0.518	rusty blue monument, fair condition

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW171	4/09/2023	28.76	0.478	
MW172	7/08/2017	16.3	0.472	sampled at 17.3
MW172	11/11/2019	16.438	0.334	Could not get bladder pump or bailer down. Likely blocked by tree roots, difficult to get interface probe down as well (frequently stuck)
MW172	22/11/2019	16.521	0.251	
MW172	9/01/2020			Dry, stickup next to well was 19.8 deep and only had water at bottom of well.
MW172	1/04/2020			Dry
MW172	21/07/2020			DRY
MW172	22/09/2020			
MW172	22/09/2020			
MW172	14/12/2020			DRY
MW172	15/03/2021			Dry
MW172	10/06/2021			Dry
MW172	30/08/2021			Dry
MW172	16/11/2021			Dry
MW172	10/01/2022			Dry
MW172	15/03/2022			
MW172	8/06/2022	16.32	0.452	
MW172	6/09/2022	16.357	0.415	
MW172	12/12/22	16.474	0.298	
MW172	13/03/2023	16.415	0.357	
MW172	6/06/2023	16.22	0.552	
MW172	4/09/2023			Not accessed due to risk
MW173	9/08/2017	9.575	0.505	sampled at 10.57
MW173	18/09/2017	10.72	-0.64	
MW173	19/10/2017	9.665	0.415	low flow
MW173	15/11/2017	9.69	0.39	
MW173	7/12/2017	9.7	0.38	
MW173	16/01/2018	9.75	0.33	
MW173	15/11/2019	9.73	0.35	
MW173	16/01/2020	8.8	1.28	
MW173	31/03/2020	9.4	0.68	
MW173	22/07/2020	9.53	0.55	
MW173	22/09/2020			DRY
MW173	16/12/2020			DRY
MW173	16/03/2021	9.595	0.485	Clear
MW173	10/06/2021	9.471	0.609	
MW173	30/08/2021	11.11	-1.03	Dry
MW173	15/11/2021	9.696	0.384	
MW173	16/11/2021	11.11	-1.03	Dry
MW173	10/01/2022	11.11	-1.03	Dry
MW173	15/03/2022	9.53	0.55	
MW173	4/05/2022	9.559	0.521	Silver monument
MW173	8/06/2022	9.5	0.58	
MW173	5/09/2022	9.599	0.481	
MW173	18/11/2022	9.706	0.374	
MW173	12/12/22	9.695	0.385	
MW173	13/03/2023	9.614	0.466	
MW173	9/05/2023	9.574	0.506	Monument, Good condition, Large steel collar.
MW173	6/06/2023	9.387	0.693	
MW173	14/07/2023	9.558	0.522	monument, PVC height 0.44 m
MW173	4/09/2023	9.63	0.45	
MW193	8/08/2017	11.23	0.63	sampled at 12.23
MW193	18/09/2017	11.36	0.5	
MW193	19/10/2017	11.32	0.54	low flow
MW193	15/11/2017	11.35	0.51	
MW193	7/12/2017	11.375	0.485	
MW193	16/01/2018	11.38	0.48	
MW193	28/10/2019	11.465	0.395	
MW193	8/01/2020	11.4	0.46	Bore not labelled
MW193	31/03/2020	11.19	0.67	
MW193	15/07/2020	11.1	0.76	
MW193	21/09/2020	13.5	-1.64	
MW193	21/09/2020	13.5	-1.64	
MW193	16/12/2020	11.3	0.56	
MW193	16/03/2021	11.8	0.06	Clear
MW193	10/06/2021	11.13	0.73	
MW193	30/08/2021	11.31	0.55	
MW193	16/11/2021	11.31	0.55	
MW193	10/01/2022	11.289	0.571	Grey slight odour and quite turbid
MW193	15/03/2022	11.205	0.655	
MW193	7/06/2022	10.842	1.018	
MW193	5/09/2022	11.249	0.611	
MW193	12/12/22	11.394	0.466	
MW193	13/03/2023	11.31	0.55	
MW193	9/05/2023	11.22	0.64	
MW193	6/06/2023	11.037	0.823	
MW193	4/09/2023	11.28	0.58	
MW195D	9/08/2017	3.915	0.448	sampled at 13
MW195D	28/10/2019	4.175	0.188	
MW195D	8/01/2020	4.34	0.023	
MW195D	31/03/2020	4.184	0.179	
MW195D	15/07/2020	4	0.363	
MW195D	21/09/2020	4.234	0.129	
MW195D	21/09/2020	4.234	0.129	
MW195D	16/12/2020	4.23	0.133	
MW195D	16/03/2021	4.17	0.193	Clear
MW195D	9/06/2021	4.055	0.308	
MW195D	30/08/2021	4.27	0.093	
MW195D	15/11/2021	4.07	0.293	
MW195D	16/11/2021	4.27	0.093	
MW195D	10/01/2022	4.26	0.103	
MW195D	15/03/2022	4.129	0.234	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW195D	4/05/2022	3.925	0.438	Blue rusted monument
MW195D	7/06/2022	3.53	0.833	
MW195D	5/09/2022	4.146	0.217	
MW195D	18/11/2022	4.083	0.28	
MW195D	12/12/22	4.308	0.055	
MW195D	13/03/2023	4.142	0.221	
MW195D	9/05/2023	3.88	0.483	Monument, Good condition, Steel stick up. Yellow top and Hi-Vis band.
MW195D	6/06/2023	3.958	0.405	
MW195D	14/07/2023	3.913	0.45	rusted blue monument
MW195D	4/09/2023	3.99	0.373	
MW195S	9/08/2017	4.13	0.441	sampled at 4.5
MW195S	18/09/2017	4.274	0.297	Abundant roots present, blockage at 5.394 mbtoc
MW195S	19/10/2017	4.24	0.331	ROOTLETS PRESENT
MW195S	15/11/2017	4.265	0.306	Some roots present, no odour staining
MW195S	7/12/2017	4.27	0.301	SL ORGANIC ODOUR, TANNIN APPEARANCE
MW195S	16/01/2018	4.294	0.277	SL ORGANIC ODOUR, TANNIN APPEARANCE
MW195S	6/11/2019	6.5	-1.929	Dry
MW195S	8/01/2020	4.31	0.261	Bore labelled MW292_I
MW195S	31/03/2020	4.16	0.411	
MW195S	15/07/2020	4	0.571	
MW195S	21/09/2020	4.186	0.385	
MW195S	21/09/2020	4.186	0.385	
MW195S	16/12/2020	4.185	0.386	
MW195S	16/03/2021	3.8	0.771	Clear
MW195S	9/06/2021	4.055	0.516	
MW195S	30/08/2021	4.17	0.401	
MW195S	15/11/2021	4.213	0.358	
MW195S	16/11/2021	4.17	0.401	
MW195S	10/01/2022	4.21	0.361	
MW195S	15/03/2022	4.075	0.496	
MW195S	4/05/2022	4.135	0.436	
MW195S	7/06/2022	3.487	1.084	
MW195S	5/09/2022	4.09	0.481	
MW195S	15/11/2022			Damaged/bent and blocked. Unable to sample or accurately gauge due to obstructions
MW195S	12/12/22	4.26	0.311	
MW195S	13/03/2023	4.205	0.366	
MW195S	8/05/2023			Dry
MW195S	6/06/2023	3.405	1.166	
MW195S	4/09/2023			Dry
MW196	8/08/2017	12.456	0.294	sampled at 13.70
MW196	29/10/2019	12.67	0.08	
MW196	16/01/2020	13.9	-1.15	
MW196	2/04/2020	12.504	0.246	Bore labelled as MB52
MW196	22/07/2020	12.4	0.35	
MW196	24/09/2020	12.535	0.215	
MW196	24/09/2020	12.535	0.215	
MW196	16/12/2020	12.5	0.25	
MW196	16/03/2021			DRY
MW196	10/06/2021	12.36	0.39	Hand bailed
MW196	30/08/2021	12.44	0.31	
MW196	16/11/2021	12.44	0.31	
MW196	14/03/2022	12.422	0.328	
MW196	7/06/2022			Dry
MW196	6/09/2022	12.376	0.374	
MW196	13/12/22	12.543	0.207	
MW196	13/03/2023	12.48	0.27	
MW196	6/06/2023	12.38	0.37	
MW196	14/07/2023	12.425	0.325	monument, PVC height 0.60 m
MW196	5/09/2023			Dry
MW197	9/08/2017	1.68	0.6	sampleda at 2
MW197	18/09/2017	2.157	0.123	
MW197	19/10/2017	2.06	0.22	NO ODOUR&SHEEN
MW197	15/11/2017	2.277	0.003	no o/s
MW197	7/12/2017	2.31	-0.03	NO ODOUR, SL TANNIN APPEARANCE
MW197	16/01/2018	2.126	0.154	NO ODOUR, SL TANNIN APPEARANCE
MW197	9/01/2020			Bore damaged by fallen tree- bent, could not put hydrasleeve down
MW197	31/03/2020	2.1	0.18	
MW197	15/07/2020	1.93	0.35	Not enough water to take readings
MW197	24/09/2020			
MW197	15/12/2020			Dry
MW197	16/03/2021	2.015	0.265	Clear
MW197	9/06/2021	1.91	0.37	
MW197	1/09/2021	2.001	0.279	
MW197	10/01/2022			Dry
MW197	14/03/2022	2.04	0.24	
MW197	7/06/2022	2.061	0.219	
MW197	5/09/2022	1.985	0.295	Eoh 2.052mbtoc
MW197	12/12/22	2.305	-0.025	
MW197	14/03/2023	2.187	0.093	
MW197	7/06/2023	1.89	0.39	
MW197	14/07/2023	2.063	0.217	white casing only, PVC height 0.82 m
MW197	5/09/2023			Dry/blocked, unable to clear with steel bailer
MW199	8/08/2017	11.54	0.26	sampled at 12.54
MW199	18/09/2017	11.625	0.175	
MW199	19/10/2017	11.6	0.2	low flow
MW199	15/11/2017	11.61	0.19	
MW199	7/12/2017	11.615	0.185	
MW199	16/01/2018	11.665	0.135	
MW199	29/10/2019	11.74	0.06	
MW199	8/01/2020	11.4	0.4	
MW199	31/03/2020	8.65	3.15	
MW199	15/07/2020	11.14	0.66	
MW199	21/09/2020	11.474	0.326	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW199	21/09/2020	11.474	0.326	
MW199	16/12/2020	11.27	0.53	
MW199	16/03/2021			blocked less than 1 metre
MW199	9/06/2021			Well banded at approx 1.5m, unable to fix with steel bailer
MW199	30/08/2021	11.26	0.54	
MW199	16/11/2021	11.26	0.54	
MW199	10/01/2022	11.43	0.37	
MW199	17/03/2022	11.39	0.41	
MW199	7/06/2022	10.571	1.229	
MW199	5/09/2022	11.344	0.456	
MW199	12/12/22	11.469	0.331	
MW199	13/03/2023	11.548	0.252	
MW199	6/06/2023	11.334	0.466	
MW199	14/07/2023	11.235	0.565	
MW199	5/09/2023			Blocked/bent casing BGL
MW200	9/08/2017	1.635	0.435	sampled at 2
MW200	18/09/2017	1.733	0.337	
MW200	19/10/2017	2.115	-0.045	NO ODOUR&SHEEN
MW200	15/11/2017	1.893	0.177	no o/s
MW200	7/12/2017	1.975	0.095	NO ODOUR, SL TANNIN APPEARANCE
MW200	16/01/2018	1.768	0.302	NO ODOUR, SL TANNIN APPEARANCE
MW200	11/11/2019	1.995	0.075	
MW200	9/01/2020	1.98	0.09	
MW200	31/03/2020	1.67	0.4	
MW200	15/07/2020	1.84	0.23	Bore survey may be required
MW200	24/09/2020	1.125	0.945	
MW200	24/09/2020	1.125	0.945	
MW200	15/12/2020	2.07	0	
MW200	16/03/2021	1.82	0.25	Clear
MW200	9/06/2021	1.675	0.395	
MW200	1/09/2021	1.856	0.214	
MW200	16/11/2021	1.942	0.128	
MW200	10/01/2022	2.06	0.01	
MW200	14/03/2022	1.84	0.23	
MW200	4/05/2022	2.203	-0.133	PVC only, well is small diameter peri located near metal square sign on beach
MW200	7/06/2022	1.879	0.191	
MW200	5/09/2022	1.846	0.224	
MW200	17/11/2022	2.025	0.045	
MW200	12/12/22	2.23	-0.16	
MW200	14/03/2023	1.998	0.072	
MW200	9/05/2023	1.75	0.32	Monument, Fair condition , Blue stick up. Rusty.
MW200	7/06/2023	1.72	0.35	
MW200	14/07/2023	1.84	0.23	white PVC casing only, cap, bailer and rope
MW200	5/09/2023	2.03	0.04	
MW202	9/08/2017	1.51	0.61	sampled at 2.0
MW202	18/09/2017	1.841	0.279	No bore cap resulted in organic matter (leaf litter) present within water column
MW202	19/10/2017	1.91	0.21	ROOTLETS PRESENT
MW202	15/11/2017	1.952	0.168	no o/s
MW202	7/12/2017	2.028	0.092	NO ODOUR, SL TANNIN APPEARANCE
MW202	16/01/2018	1.772	0.348	NO ODOUR, SL TANNIN APPEARANCE
MW202	17/01/2020			Not found
MW202	31/03/2020	1.71	0.41	
MW202	22/07/2020	1.62	0.5	
MW202	21/09/2020	1.92	0.2	
MW202	21/09/2020	1.92	0.2	
MW202	16/12/2020	1.95	0.17	
MW202	15/03/2021	1.82	0.3	Clear
MW202	10/06/2021	1.385	0.735	
MW202	30/08/2021	1.85	0.27	
MW202	16/11/2021	1.85	0.27	
MW202	12/01/2022	1.87	0.25	Hand bailed hydrasleeve broke upon retrieval.
MW202	8/06/2022	1.72	0.4	
MW202	5/09/2022	1.4	0.72	
MW202	12/12/22	1.98	0.14	
MW202	13/03/2023	1.77	0.35	
MW202	7/06/2023	1.532	0.588	
MW202	5/09/2023	1.86	0.26	
MW203	9/08/2017	4.54	6.315	sampled at 11.54
MW203	8/11/2019	10.705	0.15	
MW203	8/01/2020	10.73	0.125	
MW203	31/03/2020	10.61	0.245	
MW203	15/07/2020	10.42	0.435	
MW203	22/09/2020	10.56	0.295	
MW203	22/09/2020	10.56	0.295	
MW203	16/12/2020	10.605	0.25	
MW203	16/03/2021	10.52	0.335	Clear
MW203	9/06/2021	10.44	0.415	
MW203	30/08/2021	10.43	0.425	
MW203	16/11/2021	10.43	0.425	
MW203	10/01/2022	10.52	0.335	
MW203	17/03/2022	10.54	0.315	
MW203	7/06/2022	10.41	0.445	
MW203	6/09/2022	10.38	0.475	
MW203	12/12/22	10.54	0.315	
MW203	13/03/2023	10.58	0.275	
MW203	6/06/2023	10.446	0.409	
MW203	14/07/2023	10.458	0.397	white casing only, PVC height 0.52 m
MW203	5/09/2023	10.55	0.305	
MW214	2/08/2017	7.76	0.315	sampled at 8.76
MW214	10/01/2020			Dry
MW214	31/03/2020			Bore Dry
MW214	22/07/2020			Dry
MW214	24/09/2020			

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW214	24/09/2020			
MW214	15/12/2020			DRY
MW214	18/03/2021			Dry
MW214	9/06/2021			Dry
MW214	1/09/2021	7.64	0.435	
MW214	16/11/2021	7.64	0.435	Bore blocked by fine sedimend. Unblocked and hand bailed
MW214	7/06/2022	7.67	0.405	
MW214	6/09/2022	7.545	0.53	
MW214	13/12/22	7.932	0.143	
MW214	14/03/2023	7.726	0.349	
MW214	8/06/2023	7.608	0.467	
MW214	4/09/2023	7.66	0.415	
MW215	2/08/2017	3.555	0.239	Sampled 4.55
MW215	10/01/2020			Dry
MW215	31/03/2020			Bore Dry 3.34m
MW215	22/07/2020			Dry
MW215	22/07/2020			Dry
MW215	24/09/2020			
MW215	24/09/2020			
MW215	15/12/2020			Dry
MW215	18/03/2021			Dry
MW215	9/06/2021			Dry at 3.11
MW215	1/09/2021	3.416	0.378	
MW215	7/06/2022	3.46	0.334	
MW215	6/09/2022	3.308	0.486	
MW215	13/12/22	3.702	0.092	
MW215	14/03/2023	3.542	0.252	
MW215	8/06/2023	3.429	0.365	
MW215	4/09/2023	3.47	0.324	
MW216	2/08/2017	7.945	0.384	sampled at 8.5
MW216	11/09/2017	7.91	0.419	
MW216	16/10/2017	7.905	0.424	
MW216	17/11/2017	7.92	0.409	
MW216	5/12/2017	7.97	0.359	NO O/S
MW216	15/01/2018	8.07	0.259	NO O/S
MW216	19/12/2019	7.9	0.429	
MW216	31/03/2020	7.905	0.424	
MW216	22/07/2020			
MW216	24/09/2020			
MW216	15/12/2020	7.91	0.419	
MW216	18/03/2021	8.93	-0.601	Clear
MW216	9/06/2021	7.752	0.577	
MW216	31/08/2021	7.909	0.42	
MW216	16/03/2022	7.8	0.529	
MW216	7/06/2022	7.87	0.459	
MW216	5/09/2022	7.848	0.481	
MW216	13/12/22	8.069	0.26	
MW216	14/03/2023	7.944	0.385	
MW216	8/06/2023	7.825	0.504	
MW216	4/09/2023	7.87	0.459	
MW217	2/08/2017	8.365	0.482	sampled at 8.80
MW217	11/09/2017	8.4	0.447	
MW217	16/10/2017	8.43	0.417	
MW217	17/11/2017	8.445	0.402	
MW217	5/12/2017	8.45	0.397	NO O/S
MW217	15/01/2018	8.56	0.287	NO O/S
MW217	18/12/2019	8.49	0.357	
MW217	31/03/2020	8.438	0.409	Hydrosleeve broken - hand bailed
MW217	22/07/2020	8.31	0.537	
MW217	24/09/2020	8.458	0.389	
MW217	24/09/2020	8.458	0.389	
MW217	15/12/2020	8.42	0.427	
MW217	18/03/2021	8.43	0.417	Clear
MW217	9/06/2021	8.28	0.567	
MW217	31/08/2021	8.355	0.492	
MW217	16/11/2021	8.355	0.492	
MW217	18/11/2021	8.384	0.463	
MW217	13/01/2022	8.455	0.392	Cloudy no odour
MW217	17/03/2022	8.35	0.497	
MW217	8/06/2022	8.93	-0.083	
MW217	8/09/2022	8.255	0.592	
MW217	16/11/2022	8.472	0.375	
MW217	13/12/22	8.5	0.347	
MW217	15/03/2023	8.47	0.377	
MW217	8/06/2023	8.23	0.617	
MW217	14/07/2023	8.345	0.502	monument
MW217	4/09/2023	8.838	0.009	
MW220	2/08/2017	6.49		sampled at 7.49
MW220	11/09/2017	6.62		
MW220	16/10/2017	6.7		
MW220	17/11/2017	6.715		
MW220	5/12/2017	6.706		NO O/S
MW220	15/01/2018	6.777		NO O/S
MW220	18/12/2019			Dry
MW220	31/03/2020			Bore Dry
MW220	22/07/2020	6.52		Blocked w roots could not sample
MW220	24/09/2020			
MW220	24/09/2020			
MW220	15/12/2020			DRY
MW220	18/03/2021			Dry
MW220	9/06/2021	6.545		Only PFAS Sample collected. not enough water
MW220	31/08/2021			Dry
MW220	16/11/2021			Dry

Table 9 - Groundwater Gauging data

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW220	18/11/2021	6.658		Blocked with roots
MW220	13/01/2022	6.7		Lots of roots present. Organic smell.
MW220	17/03/2022			
MW220	8/06/2022	6.86		
MW220	8/09/2022	5.13		
MW220	16/11/2022	6.674		
MW220	13/12/22	6.68		
MW220	15/03/2023			
MW220	8/06/2023	6.23		
MW220	14/07/2023	6.612		silver monument
MW220	4/09/2023	8.63		
MW224	9/08/2017	12.925	0.447	sampled at 13.93
MW224	18/12/2019	13.13	0.242	
MW224	31/03/2020	13.043	0.329	
MW224	22/07/2020	12.89	0.482	
MW224	24/09/2020	13.011	0.361	
MW224	24/09/2020	13.011	0.361	
MW224	15/12/2020	13.06	0.312	
MW224	18/03/2021	12.95	0.422	Clear
MW224	9/06/2021	12.88	0.492	
MW224	31/08/2021	12.9	0.472	
MW224	16/11/2021	12.9	0.472	
MW224	13/01/2022	12.99	0.382	
MW224	17/03/2022	12.98	0.392	
MW224	8/06/2022	13.38	-0.008	
MW224	8/09/2022	12.25	1.122	
MW224	13/12/22	12.95	0.422	
MW224	15/03/2023	12.975	0.397	
MW224	8/06/2023	12.33	1.042	
MW224	14/07/2023	12.965	0.407	Silver monument
MW224	4/09/2023	12.99	0.382	
MW225	2/08/2017	3.94	0.126	sampled at 4.3
MW225	11/09/2017	3.85	0.216	
MW225	19/10/2017	3.92	0.146	NO ODOUR&SHEEN
MW225	17/11/2017	3.813	0.253	no o/s
MW225	5/12/2017	3.892	0.174	NO O/S
MW225	15/01/2018	3.971	0.095	NO O/S
MW225	10/01/2020			Dry
MW225	31/03/2020			Bore Dry
MW225	22/07/2020			DRY
MW225	24/09/2020			
MW225	24/09/2020			
MW225	15/12/2020			Dry
MW225	17/03/2021			Dry
MW225	9/06/2021			Dry
MW225	1/09/2021	3.85	0.216	
MW225	16/11/2021	3.85	0.216	Well blocked by fine sediment/sand. Unblocked and sampled with bailer
MW225	16/03/2022	3.69	0.376	
MW225	7/06/2022	3.75	0.316	
MW225	6/09/2022	3.66	0.406	
MW225	13/12/22	4.03	0.036	
MW225	14/03/2023	3.865	0.201	
MW225	8/06/2023	3.759	0.307	
MW225	14/07/2023	3.631	0.435	Gauged only
MW225	4/09/2023	3.87	0.196	
MW226	2/08/2017	1.75	-0.001	sampled at 2
MW226	11/09/2017	1.69	0.059	
MW226	19/10/2017	1.755	-0.006	NO ODOUR&SHEEN
MW226	17/11/2017	1.622	0.127	no o/s
MW226	5/12/2017	1.742	0.007	NO ODOUR, SL TANNIN APPEARANCE
MW226	15/01/2018	1.781	-0.032	NO ODOUR, SL TANNIN APPEARANCE
MW226	14/01/2020	1.9	-0.151	
MW226	2/04/2020	1.611	0.138	
MW226	21/07/2020	1.49	0.259	
MW226	22/09/2020	1.7	0.049	
MW226	22/09/2020	1.7	0.049	
MW226	15/12/2020	1.72	0.029	
MW226	17/03/2021	1.415	0.334	Clear,Yellow
MW226	10/06/2021	1.1	0.649	
MW226	31/08/2021	1.716	0.033	
MW226	16/03/2022	0.895	0.854	
MW226	7/06/2022	1.75	-0.001	
MW226	6/09/2022	1.48	0.269	
MW226	13/12/22	1.42	0.329	
MW226	14/03/2023	1.62	0.129	
MW226	8/06/2023	1.5	0.249	
MW226	14/07/2023	1.276	0.473	Gauged only
MW226	4/09/2023	1.66	0.089	
MW227	2/08/2017	2.85	0.111	3.1
MW227	11/09/2017	2.82	0.141	
MW227	19/10/2017	2.75	0.211	NO ODOUR&SHEEN
MW227	17/11/2017	2.829	0.132	no o/s
MW227	5/12/2017	2.844	0.117	NO ODOUR, SL TANNIN STAINING
MW227	15/01/2018	2.96	0.001	NO ODOUR, SL TANNIN STAINING
MW227	17/01/2020	4.2	-1.239	Not found
MW227	1/04/2020	2.795	0.166	
MW227	22/07/2020	2.705	0.256	
MW227	21/09/2020	2.77	0.191	
MW227	21/09/2020	2.77	0.191	
MW227	15/12/2020	2.78	0.181	
MW227	15/03/2021	2.8	0.161	Clear,Cloudy
MW227	10/06/2021	2.488	0.473	
MW227	31/08/2021	2.807	0.154	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW227	14/01/2022	2.88	0.081	
MW227	16/03/2022	2.702	0.259	
MW227	7/06/2022	2.73	0.231	
MW227	7/09/2022	2.61	0.351	
MW227	13/12/22	2.94	0.021	
MW227	14/03/2023	2.85	0.111	
MW227	8/06/2023	2.725	0.236	
MW227	14/07/2023	2.592	0.369	silver monument with HS
MW227	5/09/2023	2.795	0.166	
MW228	2/08/2017	2.15	0.08	sampled at 2.4
MW228	11/09/2017	2.115	0.115	
MW228	19/10/2017	2.195	0.035	NO ODOUR&SHEEN
MW228	17/11/2017	2.129	0.101	no o/s
MW228	5/12/2017	2.145	0.085	NO ODOUR, SL TANNIN STAINING
MW228	15/01/2018	2.268	-0.038	NO ODOUR, SL TANNIN STAINING
MW228	14/01/2020	3.75	-1.52	
MW228	1/04/2020	2.082	0.148	
MW228	22/07/2020	1.98	0.25	
MW228	21/09/2020	3.075	-0.845	
MW228	21/09/2020	3.075	-0.845	
MW228	15/12/2020	2.065	0.165	
MW228	15/03/2021	2.08	0.15	Cloudy,Clear,Brown
MW228	10/06/2021	1.675	0.555	
MW228	31/08/2021	2.086	0.144	
MW228	14/01/2022	2.17	0.06	
MW228	16/03/2022	2	0.23	
MW228	7/06/2022	1.92	0.31	
MW228	7/09/2022	1.893	0.337	
MW228	13/12/22	2.269	-0.039	
MW228	14/03/2023	2.13	0.1	
MW228	8/06/2023	1.945	0.285	
MW228	14/07/2023	1.808	0.422	silver monument with HS
MW228	5/09/2023	2.06	0.17	
MW233	8/08/2017	2.99	0.715	sampled at 3.5
MW233	13/09/2017	3.175	0.53	
MW233	19/10/2017	3.265	0.44	
MW233	21/11/2017	3.435	0.27	black suspsended solids, no o/s
MW233	5/12/2017	3.3	0.405	SUSPENDED SOLIDS
MW233	19/01/2018	2.78	0.925	SUSPENDED SOLIDS
MW233	12/11/2019	3.43	0.275	
MW233	8/01/2020	3.51	0.195	Tree roots
MW233	30/03/2020	3.38	0.325	
MW233	15/07/2020	2.9	0.805	
MW233	21/09/2020	3.045	0.66	
MW233	21/09/2020	3.045	0.66	
MW233	15/12/2020	3.36	0.345	
MW233	15/03/2021	3.18	0.525	Clear
MW233	9/06/2021	2.923	0.782	
MW233	30/08/2021	2.794	0.911	
MW233	8/11/2021	3.19	0.515	
MW233	10/01/2022	3.33	0.375	
MW233	17/03/2022	3.31	0.395	
MW233	3/05/2022	3.215	0.49	Silver monument. Well casing (metal top) broken but placed on top of pvc
MW233	8/06/2022	3.09	0.615	
MW233	6/09/2022	2.64	1.065	
MW233	15/11/2022	3.253	0.452	
MW233	13/12/22	3.26	0.445	
MW233	13/03/2023	3.355	0.35	
MW233	9/05/2023	3.042	0.663	Monument, Good condition
MW233	6/06/2023			No SWL recorded
MW233	4/09/2023			
MW236	8/08/2017	4.05	0.592	sampled at 4.5
MW236	13/09/2017	4.105	0.537	
MW236	19/10/2017	4.145	0.497	
MW236	21/11/2017	4.14	0.502	no o/s
MW236	5/12/2017	4.18	0.462	
MW236	19/01/2018	4.125	0.517	
MW236	11/10/2019	4.252	0.39	
MW236	16/01/2020			Dry
MW236	2/04/2020	4.176	0.466	
MW236	16/07/2020	4	0.642	
MW236	21/09/2020	4.14	0.502	
MW236	21/09/2020	4.14	0.502	
MW236	15/12/2020	4.18	0.462	
MW236	16/03/2021	4.08	0.562	Clear
MW236	10/06/2021	4.01	0.632	
MW236	31/08/2021	3.95	0.692	
MW236	8/11/2021	4.117	0.525	
MW236	16/11/2021	3.95	0.692	
MW236	10/01/2022	4.104	0.538	Hydrasleeve broke upon retrieval.
MW236	17/03/2022	5.66	-1.018	
MW236	3/05/2022	4.071	0.571	Gatic in good condition
MW236	7/06/2022	3.995	0.647	
MW236	6/09/2022	3.88	0.762	
MW236	15/11/2022	4.101	0.541	
MW236	13/12/22	4.13	0.512	Hydrasleeve didn't fill up
MW236	13/03/2023			Dry
MW236	10/05/2023	3.913	0.729	Monument, Good condition
MW236	6/06/2023	4.12	0.522	
MW236	5/09/2023	4.085	0.557	
MW238	4/08/2017	4.273	0.554	sampled at 5.77
MW238	13/09/2017	4.27	0.557	
MW238	19/10/2017	4.37	0.457	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW238	21/11/2017	4.44	0.387	
MW238	5/12/2017	4.46	0.367	
MW238	19/01/2018	4.39	0.437	
MW238	21/10/2019	4.49	0.337	
MW238	14/01/2020	4	0.827	
MW238	1/04/2020	4.38	0.447	
MW238	16/07/2020	4.315	0.512	
MW238	21/09/2020	4.39	0.437	
MW238	21/09/2020	4.39	0.437	
MW238	29/09/2020	4.383	0.444	
MW238	30/09/2020	4.374	0.453	
MW238	15/12/2020	4.505	0.322	
MW238	15/02/2021	4.476	0.351	
MW238	18/03/2021	4.45	0.377	Clear
MW238	10/06/2021	4.29	0.537	
MW238	31/08/2021	3.975	0.852	
MW238	16/11/2021	3.975	0.852	
MW238	12/01/2022	4.412	0.415	Clear no odour
MW238	9/06/2022	4.28	0.547	
MW238	6/09/2022	3.98	0.847	
MW238	13/12/22	4.385	0.442	
MW238	15/03/2023	4.47	0.357	
MW238	7/06/2023	4.31	0.517	
MW238	5/09/2023	4.31	0.517	
MW239	4/08/2017	3.485	0.545	sampled at 4.49
MW239	18/10/2019	3.695	0.335	
MW239	14/01/2020			Dry
MW239	1/04/2020			Bore dry
MW239	22/07/2020	3.505	0.525	Bore is damaged/bent.
MW239	21/09/2020	3.59	0.44	
MW239	21/09/2020	3.59	0.44	
MW239	29/09/2020	3.594	0.436	
MW239	1/10/2020	3.593	0.437	
MW239	15/12/2020	3.725	0.305	
MW239	15/02/2021	3.694	0.336	
MW239	18/03/2021	3.63	0.4	Clear
MW239	10/06/2021	3.511	0.519	
MW239	31/08/2021	3.26	0.77	
MW239	9/11/2021	3.5	0.53	
MW239	16/11/2021	3.26	0.77	
MW239	12/01/2022	3.634	0.396	Clear slight diesel odour
MW239	3/05/2022	3.626	0.404	PVC only with large sand/construction material stockpiles directly above well.
MW239	9/06/2022	3.5	0.53	
MW239	6/09/2022	3.2	0.83	Well buried in sand stockpile
MW239	11/11/2022	2.373	1.657	Well headworks buried by sand approx (0.3m), bore located behind sign. Sand infiltration evident, possible well collapse.
MW239	13/12/22	3.6	0.43	Bore under a sand stockpile, casing filling up with sand
MW239	15/03/2023	3.69	0.34	
MW239	9/05/2023	3.432	0.598	Flush-mount (Gatic), Good condition
MW239	7/06/2023	3.53	0.5	
MW239	5/09/2023	3.53	0.5	
MW240	4/08/2017	3.94	0.543	sampled at 4.940
MW240	21/10/2019	4.159	0.324	
MW240	14/01/2020	2.7	1.783	
MW240	1/04/2020	4.18	0.303	
MW240	16/07/2020	3.99	0.493	
MW240	21/09/2020	4.035	0.448	
MW240	21/09/2020	4.035	0.448	
MW240	29/09/2020	4.036	0.447	
MW240	30/09/2020	4.03	0.453	
MW240	15/12/2020	4.19	0.293	
MW240	15/02/2021	4.137	0.346	
MW240	18/03/2021	4.7	-0.217	Clear
MW240	10/06/2021	3.94	0.543	
MW240	31/08/2021	3.67	0.813	
MW240	16/11/2021	3.67	0.813	
MW240	12/01/2022	4.068	0.415	
MW240	9/06/2022	3.935	0.548	
MW240	6/09/2022	3.657	0.826	
MW240	13/12/22	4.04	0.443	
MW240	15/03/2023	4.11	0.373	
MW240	7/06/2023	3.95	0.533	
MW240	5/09/2023	3.97	0.513	
MW242	7/08/2017	3.05	0.489	sampleda at 3.4
MW242	18/10/2019	3.238	0.301	
MW242	8/01/2020	3.359	0.18	
MW242	30/03/2020	3.934	-0.395	
MW242	16/07/2020	3.025	0.514	
MW242	21/09/2020	3.125	0.414	
MW242	21/09/2020	3.125	0.414	
MW242	29/09/2020	3.095	0.444	
MW242	1/10/2020	3.105	0.434	
MW242	15/12/2020	3.265	0.274	
MW242	16/02/2021	3.22	0.319	
MW242	18/03/2021	3.43	0.109	Clear
MW242	9/06/2021	3.03	0.509	
MW242	31/08/2021	2.755	0.784	
MW242	9/11/2021	3.038	0.501	
MW242	12/01/2022	3.17	0.369	
MW242	17/03/2022	3.22	0.319	
MW242	3/05/2022	3.145	0.394	Gatic
MW242	8/06/2022	3.03	0.509	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW242	6/09/2022	2.745	0.794	
MW242	14/11/2022	3.089	0.45	
MW242	13/12/22	3.14	0.399	
MW242	15/03/2023	3.23	0.309	
MW242	9/05/2023	2.978	0.561	Flush-mount (Gatic), Good condition
MW242	6/06/2023	3.01	0.529	
MW242	4/09/2023	3.085	0.454	
MW243	13/09/2017	3.97	0.922	
MW243	20/10/2017	4.06	0.832	
MW243	21/11/2017	4.105	0.787	no o/s
MW243	5/12/2017	4.125	0.767	
MW243	19/01/2018	4.035	0.857	
MW243	24/10/2019	4.621	0.271	
MW243	14/01/2020	4.63	0.262	
MW243	1/04/2020	4.6	0.292	
MW243	16/07/2020	4.39	0.502	
MW243	21/09/2020	4.47	0.422	
MW243	21/09/2020	4.47	0.422	
MW243	29/09/2020	4.454	0.438	
MW243	30/09/2020	4.455	0.437	
MW243	15/12/2020	4.57	0.322	
MW243	15/02/2021	4.57	0.322	
MW243	15/02/2021	4.57	0.322	
MW243	18/03/2021	4.5	0.392	
MW243	10/06/2021	4.366	0.526	
MW243	31/08/2021	4.135	0.757	
MW243	9/11/2021	4.399	0.493	
MW243	16/11/2021	4.135	0.757	
MW243	12/01/2022	4.499	0.393	
MW243	3/05/2022	4.477	0.415	Gatic
MW243	9/06/2022	4.24	0.652	
MW243	6/09/2022	4.12	0.772	
MW243	14/11/2022	4.428	0.464	
MW243	13/12/22	4.48	0.412	
MW243	15/03/2023	4.55	0.342	
MW243	9/05/2023	4.297	0.595	Flush-mount (Gatic), Good condition
MW243	7/06/2023	4.33	0.562	
MW243	5/09/2023	4.4	0.492	
MW245	4/08/2017	3.28	1.271	sampled at 4.28
MW245	13/09/2017	3.345	1.206	
MW245	20/10/2017	3.445	1.106	
MW245	21/11/2017	3.505	1.046	slight chemical odour, no sheen
MW245	5/12/2017	3.5	1.051	
MW245	19/01/2018	3.34	1.211	
MW245	21/10/2019	4.26	0.291	
MW245	14/01/2020	4.8	-0.249	
MW245	1/04/2020	4.28	0.271	
MW245	16/07/2020	3.985	0.566	
MW245	21/09/2020	4.12	0.431	
MW245	21/09/2020	4.12	0.431	
MW245	29/09/2020	4.084	0.467	
MW245	30/09/2020	3.11	1.441	
MW245	15/12/2020	4.235	0.316	
MW245	15/02/2021	4.226	0.325	
MW245	15/02/2021	4.226	0.325	
MW245	18/03/2021	4.17	0.381	Black, hydrocarbon odour
MW245	10/06/2021	3.98	0.571	
MW245	31/08/2021	3.79	0.761	
MW245	9/11/2021	4.062	0.489	
MW245	16/11/2021	3.79	0.761	
MW245	12/01/2022	4.18	0.371	
MW245	3/05/2022	4.156	0.395	Silver monument
MW245	9/06/2022	4.042	0.509	
MW245	6/09/2022	3.715	0.836	
MW245	14/11/2022	4.08	0.471	
MW245	13/12/22	4.15	0.401	
MW245	15/03/2023	4.23	0.321	
MW245	9/05/2023	4.976	-0.425	Monument, Good condition, Water Level has been flagged as potentially erroneous
MW245	7/06/2023	3.88	0.671	
MW245	5/09/2023	4.08	0.471	
MW249	7/08/2017	4.788	0.439	sampled at 5.1
MW249	13/09/2017	4.81	0.417	
MW249	20/10/2017	4.91	0.317	
MW249	21/11/2017	4.98	0.247	
MW249	5/12/2017	5	0.227	
MW249	19/01/2018	4.87	0.357	
MW249	15/11/2019	5.062	0.165	
MW249	8/01/2020	5.14	0.087	
MW249	30/03/2020	5.036	0.191	
MW249	16/07/2020	4.8	0.427	
MW249	21/09/2020	4.885	0.342	
MW249	21/09/2020	4.885	0.342	
MW249	29/09/2020	4.892	0.335	
MW249	1/10/2020	4.886	0.341	
MW249	15/12/2020	5.015	0.212	
MW249	16/02/2021	4.992	0.235	
MW249	16/02/2021	4.992	0.235	
MW249	15/03/2021	4.93	0.297	Black
MW249	9/06/2021	4.973	0.254	
MW249	31/08/2021	4.57	0.657	
MW249	12/01/2022	4.95	0.277	No odour. Clayey orange in colour
MW249	17/03/2022	4.99	0.237	
MW249	8/06/2022	4.795	0.432	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW249	6/09/2022	4.572	0.655	
MW249	13/12/22	4.92	0.307	
MW249	13/03/2023	4.995	0.232	
MW249	6/06/2023	4.85	0.377	
MW249	4/09/2023	4.85	0.377	
MW255	4/08/2017	4.05	0.559	
MW255	13/09/2017	4.121	0.488	
MW255	20/10/2017	4.16	0.449	NO ODOUR&SHEEN
MW255	21/11/2017	4.147	0.462	
MW255	8/12/2017	4.19	0.419	
MW255	19/01/2018	4.136	0.473	
MW255	19/12/2019			Dry
MW255	2/04/2020			BORE DRY
MW255	16/07/2020	4.015	0.594	
MW255	22/09/2020	4.1	0.509	
MW255	22/09/2020	4.1	0.509	
MW255	16/12/2020	4.18	0.429	
MW255	17/03/2021	4.1	0.509	
MW255	10/06/2021	4.03	0.579	
MW255	31/08/2021	3.99	0.619	
MW255	16/11/2021	3.99	0.619	Murky
MW255	10/01/2022	4.15	0.459	Clear no odour
MW255	17/03/2022	4.12	0.489	
MW255	9/06/2022	4.005	0.604	
MW255	6/09/2022	6	-1.391	SWL below hydrasleeve, not recorded
MW255	13/12/22	4.152	0.457	
MW255	13/03/2023	4.16	0.449	
MW255	6/06/2023	4.23	0.379	
MW255	14/07/2023	4.041	0.568	
MW255	5/09/2023	4.11	0.499	
MW256	4/08/2017	3.3	0.54	sampled at 4
MW256	13/09/2017	3.346	0.494	
MW256	20/10/2017	3.39	0.45	NO ODOUR&SHEEN
MW256	21/11/2017	3.378	0.462	no o/s
MW256	8/12/2017	3.42	0.42	
MW256	19/01/2018	3.365	0.475	
MW256	8/01/2020	3.56	0.28	Root blockage at 3m could not sample
MW256	30/03/2020	3.418	0.422	
MW256	16/07/2020	3.24	0.6	
MW256	22/09/2020	3.34	0.5	
MW256	22/09/2020	3.34	0.5	
MW256	14/12/2020	3.4	0.44	
MW256	17/03/2021	3.345	0.495	
MW256	10/06/2021	3.225	0.615	
MW256	31/08/2021	3.2	0.64	
MW256	16/11/2021	3.2	0.64	
MW256	10/01/2022	3.36	0.48	
MW256	17/03/2022	3.34	0.5	
MW256	9/06/2022	3.225	0.615	
MW256	6/09/2022	3.09	0.75	
MW256	13/12/22	3.37	0.47	
MW256	13/03/2023	3.23	0.61	
MW256	6/06/2023	3.26	0.58	
MW256	5/09/2023	3.335	0.505	
MW257	4/08/2017	3.315	0.491	sampled at 4
MW257	13/09/2017	3.367	0.439	
MW257	20/10/2017	3.4	0.406	NO ODOUR&SHEEN
MW257	21/11/2017	3.382	0.424	no o/s
MW257	8/12/2017	3.433	0.373	NO O/S
MW257	19/01/2018	3.361	0.445	NO O/S
MW257	19/12/2019	3.47	0.336	
MW257	2/04/2020	3.416	0.39	SWL TAKEN AFTER SAMPLING - INACCURATE READING
MW257	16/07/2020	3.245	0.561	
MW257	22/09/2020	3.37	0.436	
MW257	22/09/2020	3.37	0.436	
MW257	16/12/2020	3.39	0.416	
MW257	18/03/2021	3.82	-0.014	
MW257	9/06/2021	5.268	-1.462	
MW257	31/08/2021	3.225	0.581	
MW257	16/11/2021	3.225	0.581	
MW257	10/01/2022	3.35	0.456	
MW257	17/03/2022	3.34	0.466	
MW257	9/06/2022	3.235	0.571	
MW257	6/09/2022	5.7	-1.894	SWL below hydrasleeve, not recorded
MW257	13/12/22	3.39	0.416	
MW257	13/03/2023	3.39	0.416	
MW257	6/06/2023	3.225	0.581	
MW257	14/07/2023	3.254	0.552	flush mount corner of fence and brick wall, plastic cover
MW257	5/09/2023	3.34	0.466	
MW258	4/08/2017	3.565	0.478	sampled at 4
MW258	13/09/2017	3.621	0.422	
MW258	20/10/2017	3.645	0.398	NO ODOUR&SHEEN
MW258	21/11/2017	3.623	0.42	no o/s
MW258	8/12/2017	3.68	0.363	NO ODOUR, SL TANNIN APPEARANCE
MW258	19/01/2018	3.597	0.446	NO ODOUR, SL TANNIN APPEARANCE
MW258	19/12/2019			Dry
MW258	2/04/2020			BORE DRY
MW258	16/07/2020			DRY
MW258	22/09/2020			
MW258	22/09/2020			
MW258	16/12/2020			Dry
MW258	18/03/2021			Dry. Potentially blocked by tree roots
MW258	10/06/2021			DRY

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW258	31/08/2021			Dry
MW258	16/11/2021			Dry
MW258	10/01/2022			Blocked at 3.69
MW258	17/03/2022			
MW258	8/06/2022	3.68	0.363	Unblocked
MW258	6/09/2022			SWL below hydrasleeve. not recorded.
MW258	13/12/22	3.65	0.393	
MW258	13/03/2023	3.57	0.473	
MW258	6/06/2023	3.472	0.571	
MW258	14/07/2023	3.495	0.548	flush mount, plastic cover
MW258	5/09/2023	3.58	0.463	
MW259	4/08/2017	3.34	0.46	sampled at 3.6
MW259	13/09/2017	3.39	0.41	
MW259	20/10/2017	3.41	0.39	NO ODOUR&SHEEN
MW259	21/11/2017	3.391	0.409	no o/s
MW259	8/12/2017	3.449	0.351	NO ODOUR, V SL TANNIN APPEARANCE
MW259	19/01/2018	3.371	0.429	NO ODOUR, V SL TANNIN APPEARANCE
MW259	19/12/2019			Dry
MW259	2/04/2020	3.321	0.479	OBSTRUCTION IN BORE AT 3.4M - UNABLE TO SAMPLE VIA HAND BAILER
MW259	16/07/2020	3.215	0.585	
MW259	22/09/2020	3.39	0.41	
MW259	22/09/2020	3.39	0.41	
MW259	16/12/2020	3.34	0.46	
MW259	18/03/2021	3.32	0.48	
MW259	10/06/2021	3.22	0.58	
MW259	31/08/2021	3.65	0.15	
MW259	16/11/2021	3.65	0.15	Roots
MW259	11/01/2022	3.375	0.425	No odour, clear. Lots of roots
MW259	17/03/2022	3.34	0.46	
MW259	9/06/2022	3.24	0.56	
MW259	6/09/2022	3.142	0.658	
MW259	13/12/22	3.41	0.39	
MW259	13/03/2023	3.28	0.52	
MW259	6/06/2023	3.23	0.57	
MW259	5/09/2023	3.63	0.17	
MW268	1/08/2017	3.9	0.156	sampled at 4.9
MW268	19/09/2017	3.911	0.145	
MW268	16/10/2017	3.77	0.286	NO ODOUR&SHEEN
MW268	17/11/2017	3.845	0.211	
MW268	7/12/2017	4.058	-0.002	NO ODOUR, SL TANNIN APPEARANCE
MW268	16/01/2018	3.884	0.172	NO ODOUR, SL TANNIN APPEARANCE
MW268	12/11/2019	4.039	0.017	
MW268	19/12/2019	3.87	0.186	
MW268	30/03/2020	3.78	0.276	
MW268	21/07/2020	3.78	0.276	
MW268	21/09/2020	3.03	1.026	
MW268	21/09/2020	3.03	1.026	
MW268	14/12/2020	2.87	1.186	
MW268	16/03/2021	3.75	0.306	
MW268	9/06/2021	3.664	0.392	
MW268	31/08/2021	3.91	0.146	
MW268	11/11/2021	3.908	0.148	
MW268	16/11/2021	3.91	0.146	
MW268	11/01/2022	3.905	0.151	
MW268	17/03/2022	3.78	0.276	
MW268	9/06/2022	3.624	0.432	
MW268	6/09/2022	3.66	0.396	
MW268	13/12/22	4.035	0.021	
MW268	15/03/2023	3.895	0.161	
MW268	6/06/2023	3.5	0.556	
MW268	4/09/2023	3.845	0.211	
MW269	1/08/2017	3.99	0.163	sampled at 4.99
MW269	19/09/2017	4.011	0.142	
MW269	16/10/2017	3.885	0.268	
MW269	17/11/2017	3.955	0.198	
MW269	7/12/2017	4.16	-0.007	NO ODOUR, V SL TANNIN APPEARANCE
MW269	16/01/2018	3.954	0.199	NO ODOUR, V SL TANNIN APPEARANCE
MW269	12/11/2019	4.16	-0.007	
MW269	19/12/2019	4	0.153	
MW269	30/03/2020	3.97	0.183	
MW269	21/07/2020	3.85	0.303	
MW269	21/09/2020	4.075	0.078	
MW269	21/09/2020	4.075	0.078	
MW269	14/12/2020	3.98	0.173	
MW269	16/03/2021	3.84	0.313	
MW269	9/06/2021	3.738	0.415	
MW269	31/08/2021	4.02	0.133	
MW269	11/11/2021	4.02	0.133	
MW269	16/11/2021	4.02	0.133	
MW269	11/01/2022	3.985	0.168	
MW269	17/03/2022	3.89	0.263	
MW269	9/06/2022	3.657	0.496	
MW269	6/09/2022	3.75	0.403	
MW269	13/12/22	4.14	0.013	
MW269	15/03/2023	4.01	0.143	
MW269	6/06/2023	3.58	0.573	
MW269	4/09/2023	3.97	0.183	
MW282	11/09/2017	5.345	0.435	
MW282	16/10/2017	5.4	0.38	
MW282	17/11/2017	5.41	0.37	
MW282	5/12/2017	5.422	0.358	NO O/S
MW282	15/01/2018	5.47	0.31	NO O/S
MW282	18/12/2019	5.5	0.28	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW282	31/03/2020	5.412	0.368	
MW282	22/07/2020	5.21	0.57	
MW282	24/09/2020	5.378	0.402	
MW282	24/09/2020	5.378	0.402	
MW282	15/12/2020	5.4	0.38	
MW282	18/03/2021	7.5	-1.72	erroneous SWL reading
MW282	9/06/2021	5.25	0.53	
MW282	31/08/2021	5.24	0.54	
MW282	16/11/2021	5.24	0.54	
MW282	13/01/2022	5.355	0.425	Very orange slight organic odour
MW282	17/03/2022	5.33	0.45	
MW282	8/06/2022	5.65	0.13	
MW282	8/09/2022	5.25	0.53	
MW282	13/12/22	5.37	0.41	
MW282	15/03/2023	5.4	0.38	
MW282	8/06/2023	5.2	0.58	
MW282	14/07/2023	5.295	0.485	flush mount with HS broken off at base, blocking bottom by 0.50 m
MW282	4/09/2023	5.36	0.42	
MW288	18/09/2017	3.863	0.14	
MW288	17/10/2017	3.665	0.338	
MW288	15/11/2017	3.94	0.063	no o/s
MW288	7/12/2017	4.005	-0.002	NO ODOUR, SL TANNIN APPEARANCE
MW288	15/01/2018	3.915	0.088	
MW288	8/01/2020	5.25	-1.247	Dry
MW288	1/04/2020	3.68	0.323	Less than 5cm of water, could not sample
MW288	15/07/2020	3.55	0.453	
MW288	22/09/2020			Dry
MW288	22/09/2020			Dry
MW288	15/12/2020			Dry
MW288	17/03/2021	3.585	0.418	
MW288	10/06/2021			Dry
MW288	31/08/2021	3.692	0.311	
MW288	12/01/2022	3.81	0.193	
MW288	8/06/2022	3.65	0.353	
MW288	6/09/2022	3.49	0.513	
MW288	12/12/22	3.76	0.243	
MW288	14/03/2023	3.84	0.163	
MW288	7/06/2023	3.52	0.483	
MW288	5/09/2023	3.79	0.213	
MW289	18/09/2017	4.119	0.376	
MW289	17/10/2017	4.11	0.385	
MW289	15/11/2017	4.21	0.285	no o/s
MW289	7/12/2017	4.195	0.3	NO O/S
MW289	15/01/2018	4.265	0.23	NO O/S
MW289	17/01/2020			Not found
MW289	30/03/2020	4.186	0.309	
MW289	22/07/2020	3.97	0.525	
MW289	21/09/2020	4.105	0.39	
MW289	21/09/2020	4.105	0.39	
MW289	15/12/2020	4.28	0.215	
MW289	16/03/2021	4.1	0.395	
MW289	9/06/2021	3.94	0.555	
MW289	30/08/2021	3.853	0.642	
MW289	17/03/2022	4.08	0.415	
MW289	8/06/2022	3.964	0.531	
MW289	5/09/2022	3.8	0.695	
MW289	13/12/22	4.145	0.35	
MW289	14/03/2023	4.2	0.295	
MW289	6/06/2023	3.858	0.637	
MW289	4/09/2023	4.045	0.45	
MW496	14/10/2019	4.985	0.107	
MW496	6/09/2022	4.639	0.453	Sampled instead of nearby damaged wells
MW496	14/11/2022	4.837	0.255	
MW496	13/12/22	4.93	0.162	
MW496	13/03/2023	4.96	0.132	
MW496	11/05/2023	4.741	0.351	Monument, Good condition, Steel stick up.
MW496	6/06/2023	4.96	0.132	
MW496	4/09/2023	4.8	0.292	
MW500	5/11/2019	3.512	0.18	
MW500	15/11/2021	3.312	0.38	
MW500	10/01/2022	3.38	0.312	Bore lid Labelled MW500, MW117 not found
MW500	14/03/2022	3.233	0.459	
MW500	7/06/2022	3.243	0.449	
MW500	5/09/2022	3.25	0.442	
MW500	12/12/22	3.45	0.242	
MW500	13/03/2023	3.33	0.362	
MW500	6/06/2023	3.075	0.617	
MW500	5/09/2023	3.305	0.387	

Table 9 - Groundwater Gauging data

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW516	30/03/2020	6.179	0.191	
MW516	21/07/2020	6.03	0.34	
MW516	21/09/2020	6.12	0.25	
MW516	21/09/2020	6.12	0.25	
MW516	30/09/2020	6.097	0.273	
MW516	7/10/2020	6.223	0.147	
MW516	16/12/2020	6.155	0.215	
MW516	16/02/2021	6.16	0.21	
MW516	17/02/2021	6.154	0.216	
MW516	18/03/2021	6.29	0.08	
MW516	9/06/2021	6.002	0.368	
MW516	31/08/2021	5.175	1.195	
MW516	16/11/2021	5.175	1.195	
MW516	12/01/2022	6.139	0.231	Clear slight fuel odour
MW516	17/03/2022	6.08	0.29	
MW516	8/06/2022	5.985	0.385	
MW516	6/09/2022	5.87	0.5	
MW516	13/12/22	6.17	0.2	
MW516	13/03/2023	6.15	0.22	
MW516	6/06/2023	5.93	0.44	
MW516	4/09/2023	6.055	0.315	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW109	3/08/2017	4.12	0.326	sampled at 5.12
MW109	20/09/2017	4.13	0.316	MW109-S
MW109	20/09/2017	4.13	0.316	MW109-D
MW109	18/10/2017	4.105	0.341	MW109-D
MW109	18/10/2017	4.105	0.341	MW109-S
MW109	16/11/2017	4.18	0.266	
MW109	16/11/2017	4.18	0.266	
MW109	6/12/2017	4.205	0.241	MW109-S
MW109	6/12/2017	4.205	0.241	MW109-D
MW109	18/01/2018	4.12	0.326	MW109-S
MW109	18/01/2018	4.12	0.326	MW109-D
MW109	16/12/2019	4.195	0.251	
MW109	30/03/2020	4.101	0.345	
MW109	15/07/2020	3.885	0.561	
MW109	21/09/2020	4.151	0.295	
MW109	21/09/2020	4.151	0.295	
MW109	14/12/2020	4.115	0.331	
MW109	16/03/2021	4.022	0.424	Clear
MW109	8/06/2021	4.03	0.416	
MW109	30/08/2021	4.12	0.326	
MW109	16/11/2021	4.12	0.326	Roots.
MW109	10/01/2022	5.5		Dry
MW109	14/03/2022	4.02	0.426	
MW109	7/06/2022	3.99	0.456	
MW109	5/09/2022	4.015	0.431	
MW109	12/12/22	4.23	0.216	
MW109	13/03/2023	4.12	0.326	
MW109	6/06/2023	3.87	0.576	
MW109	14/07/2023	4.057	0.389	flush mount with HS
MW109	5/09/2023	4.09	0.356	
MW112	3/08/2017	3.47	0.503	sampled at 5.86
MW112	20/09/2017	3.51	0.463	MW112-S
MW112	20/09/2017	3.51	0.463	MW112-D
MW112	18/10/2017	3.46	0.513	MW112-D
MW112	18/10/2017	3.46	0.513	MW112-S
MW112	16/11/2017	3.53	0.443	
MW112	16/11/2017	3.53	0.443	
MW112	6/12/2017	3.525	0.448	MW112-S
MW112	6/12/2017	3.525	0.448	MW112-D
MW112	18/01/2018	3.475	0.498	MW112-S
MW112	18/01/2018	3.475	0.498	MW112-D
MW112	8/01/2020	3.61	0.363	
MW112	30/03/2020	3.46	0.513	
MW112	15/07/2020	3.315	0.658	
MW112	21/09/2020	3.456	0.517	
MW112	21/09/2020	3.456	0.517	
MW112	14/12/2020	3.46	0.513	
MW112	16/03/2021	3.435	0.538	Clear,Green
MW112	8/06/2021	3.96	0.013	
MW112	30/08/2021	3.46	0.513	
MW112	10/01/2022	3.5	0.473	
MW112	14/03/2022	3.39	0.583	
MW112	7/06/2022	3.385	0.588	
MW112	5/09/2022	3.355	0.618	
MW112	12/12/22	3.55	0.423	
MW112	13/03/2023	3.485	0.488	
MW112	6/06/2023	3.37	0.603	
MW112	14/07/2023	3.423	0.55	flush mount with HS
MW112	5/09/2023	3.45	0.523	
MW120	3/08/2017	4.04	0.369	sampled at 5.04
MW120	20/09/2017	4.065	0.344	MW120-S
MW120	20/09/2017	4.065	0.344	MW120-D
MW120	18/10/2017	4.02	0.389	MW120-D
MW120	18/10/2017	4.02	0.389	MW120-S
MW120	16/11/2017	4.12	0.289	
MW120	16/11/2017	4.12	0.289	
MW120	6/12/2017	4.12	0.289	MW120-S
MW120	6/12/2017	4.12	0.289	MW120-D
MW120	18/01/2018	4.05	0.359	MW120-S
MW120	18/01/2018	4.05	0.359	MW120-D
MW120	4/11/2019	4.195	0.214	
MW120	16/12/2019	4.13	0.279	
MW120	30/03/2020	4.024	0.385	
MW120	15/07/2020	3.82	0.589	
MW120	21/09/2020	5.5		Dry
MW120	21/09/2020	5.5		Dry
MW120	14/12/2020	4.04	0.369	
MW120	16/03/2021	3.42	0.989	Cloudy
MW120	8/06/2021	3.96	0.449	
MW120	30/08/2021	4.06	0.349	
MW120	15/11/2021	4.036	0.373	
MW120	16/11/2021	4.06	0.349	
MW120	10/01/2022	3.34	1.069	
MW120	14/03/2022	3.946	0.463	
MW120	7/06/2022	3.955	0.454	
MW120	5/09/2022	3.947	0.462	
MW120	12/12/22	4.15	0.259	
MW120	13/03/2023	4.075	0.334	
MW120	6/06/2023	3.82	0.589	
MW120	5/09/2023	4.02	0.389	
MW121	3/08/2017	3.315	0.385	
MW121	20/09/2017	3.365	0.335	MW121-S

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW121	20/09/2017	3.365	0.335	MW121-D
MW121	18/10/2017	3.31	0.39	MW121-D
MW121	18/10/2017	3.31	0.39	MW121-S
MW121	16/11/2017	3.405	0.295	
MW121	16/11/2017	3.405	0.295	
MW121	6/12/2017	3.39	0.31	MW121-S
MW121	6/12/2017	3.39	0.31	MW121-D
MW121	18/01/2018	3.305	0.395	MW121-S
MW121	18/01/2018	3.305	0.395	MW121-D
MW121	5/11/2019	3.47	0.23	
MW121	16/12/2019	3.42	0.28	
MW121	30/03/2020	4.29	-0.59	
MW121	15/07/2020	3.165	0.535	
MW121	21/09/2020	3.356	0.344	
MW121	21/09/2020	3.356	0.344	
MW121	14/12/2020	3.4	0.3	
MW121	16/03/2021	6.22	-2.52	Cloudy
MW121	8/06/2021	3.25	0.45	
MW121	30/08/2021	4.275	-0.575	
MW121	15/11/2021	3.33	0.37	
MW121	10/01/2022	3.36	0.34	
MW121	14/03/2022	3.25	0.45	
MW121	7/06/2022	3.235	0.465	
MW121	5/09/2022	3.225	0.475	Hydrasleeve broke during recovery
MW121	12/12/22	3.42	0.28	Bore nearly dry
MW121	13/03/2023	3.36	0.34	
MW121	6/06/2023	5.7		No SWL recorded
MW121	5/09/2023	3.31	0.39	
MW123	3/08/2017	6.225	0.395	sampled at 7.26
MW123	20/09/2017	6.34	0.28	MW123-S
MW123	20/09/2017	6.34	0.28	MW123-D
MW123	18/10/2017	6.295	0.325	MW123-D, MAINS WATER LEAK, BEING REPAIRED TODAY
MW123	18/10/2017	6.295	0.325	MW123-S
MW123	16/11/2017	6.35	0.27	
MW123	16/11/2017	6.35	0.27	
MW123	6/12/2017	6.335	0.285	MW123-S
MW123	6/12/2017	6.335	0.285	MW123-D
MW123	18/01/2018	6.273	0.347	MW123-S
MW123	18/01/2018	6.273	0.347	MW123-D
MW123	16/12/2019	6.39	0.23	QC101 201 taken
MW123	30/03/2020	8		Dry
MW123	15/07/2020	8		DRY
MW123	21/09/2020	8		
MW123	21/09/2020	8		
MW123	14/12/2020	6.27	0.35	
MW123	16/03/2021	7.34	-0.72	Cloudy
MW123	8/06/2021	6.18	0.44	
MW123	30/08/2021	6.265	0.355	
MW123	15/11/2021	6.321	0.299	
MW123	16/11/2021	6.265	0.355	Hand bailed. 3 readings taken. Slight hydrocarbon odour
MW123	10/01/2022	6.27	0.35	
MW123	14/03/2022	6.23	0.39	
MW123	7/06/2022	6.18	0.44	
MW123	5/09/2022	6.17	0.45	
MW123	12/12/22	6.335	0.285	
MW123	13/03/2023	6.305	0.315	
MW123	6/06/2023	6.125	0.495	
MW123	5/09/2023	6.28	0.34	
MW124	3/08/2017	1.745	0.154	
MW124	20/09/2017	1.716	0.183	MW124-S, H2S ODOUR, GREY STAINING
MW124	20/09/2017	1.716	0.183	MW124-D, H2S ODOUR, GREY STAINING
MW124	18/10/2017	1.76	0.139	MW124-D
MW124	18/10/2017	1.76	0.139	MW124-S
MW124	16/11/2017	1.874	0.025	Slight H2S odour, no staining
MW124	6/12/2017	1.969	-0.07	MW124-D, sl H2S odour, Sl tannin staining
MW124	6/12/2017	1.972	-0.073	MW124-S, sl tannin appearance sl H2S odour
MW124	18/01/2018	1.76	0.139	MW124-S, sl tannin appearance sl H2S odour
MW124	18/01/2018	1.76	0.139	MW124-D, sl H2S odour, Sl tannin staining
MW124	9/01/2020	1.992	-0.093	
MW124	30/03/2020	1.676	0.223	
MW124	15/07/2020	1.46	0.439	
MW124	22/09/2020	1.893	0.006	
MW124	22/09/2020	1.893	0.006	
MW124	14/12/2020	1.79	0.109	
MW124	15/03/2021	1.635	0.264	Clear
MW124	8/06/2021	1.63	0.269	
MW124	30/08/2021	1.78	0.119	
MW124	16/11/2021	1.78	0.119	
MW124	10/01/2022	1.94	-0.041	
MW124	14/03/2022	1.71	0.189	
MW124	7/06/2022	1.625	0.274	
MW124	5/09/2022	1.6	0.299	
MW124	12/12/22	1.97	-0.071	
MW124	13/03/2023	1.85	0.049	
MW124	7/06/2023	1.17	0.729	
MW124	5/09/2023	1.77	0.129	
MW125	3/08/2017	1.722	0.16	sampled at 2
MW125	20/09/2017	1.738	0.144	MW125-S, H2S ODOUR, NO STAINING
MW125	20/09/2017	1.738	0.144	MW125-D, H2S ODOUR, NO STAINING
MW125	18/10/2017	1.73	0.152	MW125-D, v slight organic odour, no sheen
MW125	18/10/2017	1.73	0.152	MW125-S, v slight organic odour, no sheen
MW125	16/11/2017	1.858	0.024	H2S ODOUR
MW125	16/11/2017	1.858	0.024	H2S ODOUR

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW125	6/12/2017	1.918	-0.036	MW125-S, SL H2S ODOUR, SL TANNIN APPEARANCE
MW125	6/12/2017	1.921	-0.039	MW125-D, SL H2S ODOUR, SL TANNIN APPEARANCE
MW125	18/01/2018	1.722	0.16	MW125-S, SL H2S ODOUR, SL TANNIN APPEARANCE
MW125	18/01/2018	1.722	0.16	MW125-D, SL H2S ODOUR, SL TANNIN APPEARANCE
MW125	9/01/2020	1.97	-0.088	
MW125	30/03/2020	1.82	0.062	
MW125	15/07/2020	1.44	0.442	
MW125	22/09/2020	1.868	0.014	
MW125	22/09/2020	1.868	0.014	
MW125	14/12/2020	1.76	0.122	
MW125	15/03/2021	1.73	0.152	Clear
MW125	8/06/2021	1.63	0.252	
MW125	30/08/2021	1.77	0.112	
MW125	16/11/2021	1.77	0.112	
MW125	10/01/2022	1.9	-0.018	
MW125	14/03/2022	1.685	0.197	
MW125	7/06/2022	1.63	0.252	
MW125	5/09/2022	1.58	0.302	
MW125	12/12/22	1.965	-0.083	
MW125	13/03/2023	1.79	0.092	
MW125	7/06/2023	1.26	0.622	
MW125	5/09/2023	1.75	0.132	
MW126	3/08/2017	1.785	0.163	sampled at 2
MW126	20/09/2017	1.818	0.13	MW126-S, H2S ODOUR, GREY STAINING
MW126	20/09/2017	1.818	0.13	MW126-D, H2S ODOUR, GREY STAINING
MW126	18/10/2017	1.77	0.178	MW126-D, slight organic odour, no sheen
MW126	18/10/2017	1.77	0.178	MW126-S, slight organic odour, no sheen
MW126	16/11/2017	1.926	0.022	H2S odour, Sl Grey Staining
MW126	6/12/2017	1.922	0.026	MW126-S, H2S ODOUR, SL TANNIN APPEARANCE
MW126	6/12/2017	1.931	0.017	MW126-D, H2S ODOUR, SL TANNIN AND GREY STAINING
MW126	18/01/2018	1.74	0.208	MW126-S, H2S ODOUR, SL TANNIN APPEARANCE
MW126	18/01/2018	1.74	0.208	MW126-D, H2S ODOUR, SL TANNIN AND GREY STAINING
MW126	8/01/2020	1.73	0.218	
MW126	31/03/2020	1.866	0.082	
MW126	15/07/2020	1.54	0.408	
MW126	22/09/2020	1.913	0.035	
MW126	22/09/2020	1.913	0.035	
MW126	14/12/2020	1.79	0.158	
MW126	15/03/2021	1.825	0.123	Clear
MW126	8/06/2021	1.67	0.278	
MW126	30/08/2021	1.79	0.158	
MW126	16/11/2021	1.79	0.158	
MW126	10/01/2022	1.9	0.048	Slight sulfur odour
MW126	14/03/2022	1.74	0.208	
MW126	7/06/2022	1.71	0.238	
MW126	5/09/2022	1.64	0.308	
MW126	12/12/22	1.92	0.028	
MW126	13/03/2023	1.85	0.098	
MW126	7/06/2023	1.26	0.688	
MW126	5/09/2023	1.8	0.148	
MW127	3/08/2017	1.6	0.171	sampled at 2
MW127	20/09/2017	1.639	0.132	MW127-S
MW127	20/09/2017	1.639	0.132	MW127-D
MW127	18/10/2017	1.59	0.181	MW127-D, slight organic odour, no sheen
MW127	18/10/2017	1.59	0.181	MW127-S, slight organic odour, no sheen
MW127	16/11/2017	1.741	0.03	H2S odour, grey staining probes + Bucket
MW127	16/11/2017	1.741	0.03	H2S odour, grey staining probes + Bucket
MW127	6/12/2017	1.717	0.054	MW127-S, H2S ODOUR SL TANNIN
MW127	6/12/2017	1.731	0.04	MW127-D, H2S ODOUR, GREY STAIN, SL TANNIN
MW127	18/01/2018	1.565	0.206	MW127-S, H2S ODOUR SL TANNIN
MW127	18/01/2018	1.565	0.206	MW127-D, H2S ODOUR, GREY STAIN, SL TANNIN
MW127	8/01/2020	1.77	0.001	
MW127	31/03/2020	1.505	0.266	
MW127	15/07/2020	1.36	0.411	
MW127	22/09/2020	1.721	0.05	
MW127	22/09/2020	1.721	0.05	
MW127	14/12/2020	1.615	0.156	
MW127	15/03/2021	1.63	0.141	Clear
MW127	8/06/2021	1.505	0.266	
MW127	30/08/2021	1.59	0.181	
MW127	16/11/2021	1.59	0.181	
MW127	10/01/2022	1.81	-0.039	Slight sulfur odour
MW127	14/03/2022	1.71	0.061	
MW127	7/06/2022	1.51	0.261	
MW127	5/09/2022	1.48	0.291	
MW127	12/12/22	1.76	0.011	
MW127	13/03/2023	1.72	0.051	
MW127	7/06/2023	1.26	0.511	
MW127	5/09/2023	1.63	0.141	
MW128	3/08/2017	4.185	0.352	sampled at 5.19
MW128	20/09/2017	4.305	0.232	MW128-S
MW128	20/09/2017	4.305	0.232	MW128-D
MW128	18/10/2017	4.27	0.267	MW128-D, NO ODOUR&SHEEN
MW128	18/10/2017	4.27	0.267	MW128-S, NO ODOUR&SHEEN
MW128	16/11/2017	4.333	0.204	no o/s
MW128	16/11/2017	4.333	0.204	no o/s
MW128	6/12/2017	4.314	0.223	MW128-S, NO O/S
MW128	6/12/2017	4.317	0.22	MW128-D, NO O/S
MW128	18/01/2018	4.188	0.349	MW128-S, NO O/S
MW128	18/01/2018	4.188	0.349	MW128-D, NO O/S
MW128	21/11/2019	5.5		Dry
MW128	16/12/2019	5.5		Dry

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW128	30/03/2020	5.5		Dry
MW128	15/07/2020	5.5		DRY
MW128	21/09/2020	5.5		
MW128	21/09/2020	5.5		
MW128	14/12/2020	5.5		DRY
MW128	16/03/2021	5.5		DRY
MW128	8/06/2021	3.69		Dry at 3.7
MW128	30/08/2021	5.5		Dry
MW128	16/11/2021	5.5		Dry
MW128	10/01/2022	5.5		Dry
MW128	14/03/2022	5.5		
MW128	7/06/2022	4.31	0.227	Unblocked
MW128	5/09/2022	4.305	0.232	Insuficient water column for hydrasleeve
MW128	12/12/22	4.33	0.207	
MW128	13/03/2023	5.5		
MW128	7/06/2023	4.08	0.457	
MW128	5/09/2023	4.3	0.237	
MW139	1/08/2017	1.8	0.473	sampled at 2.1
MW139	19/09/2017	2.09	0.183	MW139-S
MW139	19/09/2017	2.09	0.183	MW139-D
MW139	17/10/2017	2.075	0.198	MW139-D TRACE SUSPENDED SOLIDS AT BEGINNING - CLEARED
MW139	17/10/2017	2.075	0.198	MW139-S
MW139	20/11/2017	2.06	0.213	no o/s
MW139	20/11/2017	2.06	0.213	no o/s
MW139	4/12/2017	2.14	0.133	MW139-S
MW139	4/12/2017	2.14	0.133	MW139-D
MW139	17/01/2018	1.795	0.478	MW139-S
MW139	17/01/2018	1.795	0.478	MW139-D
MW139	15/11/2019	2.178	0.095	
MW139	8/01/2020	2.22	0.053	
MW139	30/03/2020	2.034	0.239	
MW139	20/07/2020	1.82	0.453	
MW139	22/09/2020	2.041	0.232	
MW139	22/09/2020	2.041	0.232	
MW139	14/12/2020	2.05	0.223	
MW139	16/03/2021	2	0.273	Clear
MW139	8/06/2021	1.884	0.389	
MW139	31/08/2021	1.975	0.298	
MW139	18/11/2021	2.041	0.232	
MW139	10/01/2022	2.1	0.173	
MW139	15/03/2022	2.004	0.269	
MW139	8/06/2022	1.89	0.383	
MW139	5/09/2022	1.895	0.378	
MW139	14/11/2022	5		Groundwater depth measurements were not successfully captured in the field
MW139	12/12/22	2.095	0.178	
MW139	15/03/2023	2.108	0.165	
MW139	7/06/2023	1.789	0.484	
MW139	11/09/2023	2.06	0.213	
MW141	1/08/2017	2.675	0.35	sampled at 3.68
MW141	19/09/2017	2.84	0.185	MW141-S
MW141	19/09/2017	2.84	0.185	MW141-D
MW141	17/10/2017	2.7	0.325	MW141-D, SLIGHT ORGANIC ODOUR, NO SHEEN
MW141	17/10/2017	2.7	0.325	MW141-S
MW141	20/11/2017	2.83	0.195	no o/s, no staining
MW141	20/11/2017	2.83	0.195	no o/s, no staining
MW141	4/12/2017	2.9	0.125	MW141-S
MW141	4/12/2017	2.9	0.125	MW141-D
MW141	17/01/2018	2.74	0.285	MW141-S
MW141	17/01/2018	2.74	0.285	MW141-D
MW141	15/11/2019	2.946	0.079	
MW141	8/01/2020	2.98	0.045	
MW141	30/03/2020	2.806	0.219	
MW141	20/07/2020	2.655	0.37	
MW141	23/09/2020	2.859	0.166	
MW141	23/09/2020	2.859	0.166	
MW141	14/12/2020	2.78	0.245	
MW141	16/03/2021	2.76	0.265	Cloudy, sulfur odour
MW141	8/06/2021	1.673	1.352	
MW141	31/08/2021	2.725	0.3	
MW141	18/11/2021	2.826	0.199	
MW141	10/01/2022	2.89	0.135	
MW141	15/03/2022	2.726	0.299	
MW141	8/06/2022	2.66	0.365	
MW141	5/09/2022	2.66	0.365	
MW141	15/11/2022	5		Groundwater depth measurements were not successfully captured in the field
MW141	12/12/22	2.92	0.105	
MW141	15/03/2023	2.899	0.126	
MW141	7/06/2023	2.464	0.561	
MW141	11/09/2023	2.6	0.425	
MW142	1/08/2017	2.28	0.293	sampled at 2.5
MW142	19/09/2017	2.397	0.176	MW142-S
MW142	19/09/2017	2.397	0.176	MW142-D
MW142	17/10/2017	2.15	0.423	MW142-S NO O/S
MW142	17/10/2017	2.15	0.423	MW142-D NO O/S
MW142	20/11/2017	2.434	0.139	no o/s
MW142	20/11/2017	2.434	0.139	no o/s
MW142	4/12/2017	2.478	0.095	MW142-S, NO O/S
MW142	4/12/2017	2.478	0.095	MW142-D, NO O/S
MW142	17/01/2018	2.308	0.265	MW142-S, NO O/S
MW142	17/01/2018	2.308	0.265	MW142-D, NO O/S
MW142	15/11/2019	2.539	0.034	
MW142	8/01/2020	2.13	0.443	
MW142	30/03/2020	2.391	0.182	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW142	20/07/2020	2.18	0.393	
MW142	23/09/2020	2.463	0.11	
MW142	23/09/2020	2.463	0.11	
MW142	14/12/2020	2.36	0.213	
MW142	16/03/2021	2.32	0.253	Yellow
MW142	8/06/2021	2.275	0.298	
MW142	30/08/2021	2.338	0.235	
MW142	10/01/2022	2.49	0.083	
MW142	15/03/2022	2.275	0.298	
MW142	8/06/2022	2.22	0.353	
MW142	5/09/2022	2.295	0.278	Bore now 50cm from edge of sand dune
MW142	12/12/22	2.55	0.023	
MW142	15/03/2023	2.47	0.103	
MW142	7/06/2023	2.01	0.563	
MW142	11/09/2023	2.37	0.203	
MW147	1/08/2017	3.05	0.373	sampled at 3.
MW147	19/09/2017	3.205	0.218	MW147-S
MW147	19/09/2017	3.205	0.218	MW147-D
MW147	17/10/2017	3.045	0.378	MW147-D, ROOT FRAGS IN START UP
MW147	17/10/2017	3.045	0.378	MW147-S, ROOT FRAGS IN START UP
MW147	20/11/2017	3.19	0.233	some suspended solids @ 1min, cleared during purge, no o/s, grey staining on probes
MW147	20/11/2017	3.19	0.233	NO O/S, GREY STAIN ON PROBES
MW147	4/12/2017	3.27	0.153	MW147-S
MW147	4/12/2017	3.27	0.153	MW147-D
MW147	17/01/2018	3.125	0.298	MW147-S
MW147	17/01/2018	3.125	0.298	MW147-D
MW147	15/11/2019	5.2		Dry
MW147	8/01/2020	5.2		Dry
MW147	30/03/2020	5.2		Bore dry - no sample able to be taken
MW147	20/07/2020	2.91	0.513	
MW147	23/09/2020	5.2		
MW147	23/09/2020	5.2		
MW147	14/12/2020	5.2		Dry
MW147	16/03/2021	5.2		Dry
MW147	8/06/2021	5.2		DRY
MW147	30/08/2021	5.2		Dry
MW147	18/11/2021	3.197	0.226	
MW147	10/01/2022	5.2		Dry, difficult to access due to vegetation overgrown
MW147	15/03/2022	5.2		
MW147	8/06/2022	5.2		Dry/blocked at 2.96m
MW147	5/09/2022	5.2		Blocked at 2.5m
MW147	14/11/2022	5.2		Root blockage at 3.440 m bTOC unable to unblock.
MW147	12/12/22			Blocked and inaccessible in dense bush
MW147	15/03/2023	3.071	0.352	
MW147	7/06/2023	2.895	0.528	
MW147	11/09/2023	3.2	0.223	
MW149	1/08/2017	2.02	0.283	sampled at 2.2
MW149	19/09/2017	2.087	0.216	MW149-S
MW149	19/09/2017	2.087	0.216	MW149-D
MW149	17/10/2017	1.731	0.572	MW149-D, NO O/S
MW149	17/10/2017	1.731	0.572	MW149-S, NO O/S
MW149	20/11/2017	2.171	0.132	
MW149	20/11/2017	2.171	0.132	
MW149	4/12/2017	2.223	0.08	MW149-S, NO O/S
MW149	4/12/2017	2.217	0.086	MW149-D, NO O/S
MW149	17/01/2018	2.047	0.256	MW149-S, NO O/S
MW149	17/01/2018	2.047	0.256	MW149-D, NO O/S
MW149	15/11/2019	2.266	0.037	
MW149	8/01/2020	2.29	0.013	
MW149	30/03/2020	2.094	0.209	
MW149	20/07/2020	1.87	0.433	
MW149	23/09/2020	2.2	0.103	
MW149	23/09/2020	2.2	0.103	
MW149	14/12/2020	2.08	0.223	
MW149	16/03/2021	2.06	0.243	Clear
MW149	8/06/2021	1.975	0.328	
MW149	30/08/2021	2.066	0.237	
MW149	18/11/2021	2.173	0.13	
MW149	10/01/2022	2.21	0.093	
MW149	15/03/2022	2.026	0.277	
MW149	8/06/2022	1.91	0.393	
MW149	5/09/2022	2.02	0.283	Monument below bore casing due to beach erosion.
MW149	15/11/2022	4		Groundwater depth measurements were not successfully captured in the field
MW149	12/12/22	2.3	0.003	
MW149	15/03/2023	2.056	0.247	
MW149	7/06/2023	1.76	0.543	
MW149	11/09/2023	2.06	0.243	
MW158	7/08/2017	14.16	0.381	sampled at 15.16
MW158	1/11/2019	14.26	0.281	
MW158	8/01/2020	14.34	0.201	
MW158	31/03/2020	14.18	0.361	
MW158	21/07/2020	14.125	0.416	
MW158	21/09/2020	14.123	0.418	
MW158	21/09/2020	14.123	0.418	
MW158	14/12/2020	14.14	0.401	
MW158	15/03/2021	15.82		Clear
MW158	10/06/2021	13.991	0.55	
MW158	30/08/2021	14.58	-0.039	
MW158	16/11/2021	14.58	-0.039	
MW158	10/01/2022	15.82		Dry unable to sample
MW158	15/03/2022	14.082	0.459	
MW158	7/06/2022	13.908	0.633	
MW158	5/09/2022	14.121	0.42	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW158	12/12/22	14.31	0.231	
MW158	13/03/2023	14.252	0.289	
MW158	6/06/2023	13.98	0.561	
MW158	14/07/2023	13.137	1.404	silver monument, casing stained yellow wit slits in top of casing, poor condition. The well is located in the bushes
MW158	4/09/2023	14.18	0.361	
MW161	7/08/2017	16.585	0.64	sampled at 18.16
MW161	18/09/2017	16.775	0.45	
MW161	19/10/2017	16.725	0.5	new pump used
MW161	15/11/2017	16.765	0.46	
MW161	7/12/2017	16.76	0.465	
MW161	16/01/2018	16.775	0.45	
MW161	1/11/2019	16.722	0.503	
MW161	8/01/2020	16.97	0.255	
MW161	21/07/2020	16.62	0.605	
MW161	21/09/2020	16.528	0.697	
MW161	21/09/2020	16.528	0.697	
MW161	14/12/2020	16.77	0.455	
MW161	15/03/2021	16.7	0.525	Clear,Cloudy
MW161	10/06/2021	16.655	0.57	
MW161	30/08/2021	14.6	2.625	
MW161	15/11/2021	16.743	0.482	
MW161	16/11/2021	14.6	2.625	
MW161	10/01/2022	16.78	0.445	
MW161	15/03/2022	12.616	4.609	
MW161	5/05/2022	16.659	0.566	Unable to get total depth as well is blocked by redeployed hydrasleeve
MW161	7/06/2022	16.637	0.588	
MW161	5/09/2022	16.669	0.556	
MW161	15/11/2022	16.845	0.38	
MW161	12/12/22	16.839	0.386	
MW161	13/03/2023	16.807	0.418	
MW161	9/05/2023	16.774	0.451	
MW161	6/06/2023	16.42	0.805	
MW161	14/07/2023	16.673	0.552	
MW161	4/09/2023	16.706	0.519	
MW166	7/08/2017	11.22	0.67	sampled at 12.22
MW166	18/09/2017	11.345	0.545	
MW166	19/10/2017	11.315	0.575	
MW166	15/11/2017	11.37	0.52	
MW166	7/12/2017	11.38	0.51	
MW166	16/01/2018	11.38	0.51	
MW166	1/11/2019	11.398	0.492	
MW166	8/01/2020	11.42	0.47	
MW166	1/04/2020	11.26	0.63	
MW166	21/07/2020	11.195	0.695	
MW166	22/09/2020	11.294	0.596	
MW166	22/09/2020	11.294	0.596	
MW166	14/12/2020	11.28	0.61	
MW166	15/03/2021	11.295	0.595	
MW166	10/06/2021	12.09	-0.2	
MW166	30/08/2021	11.75	0.14	
MW166	15/11/2021	11.695	0.195	
MW166	16/11/2021	11.75	0.14	
MW166	10/01/2022	11.33	0.56	
MW166	15/03/2022	11.202	0.688	
MW166	5/05/2022	11.268	0.622	
MW166	7/06/2022	11.193	0.697	
MW166	5/09/2022	11.275	0.615	
MW166	15/11/2022	11.436	0.454	
MW166	12/12/22	11.422	0.468	
MW166	13/03/2023	11.313	0.577	
MW166	9/05/2023	11.215	0.675	
MW166	6/06/2023	11.03	0.86	
MW166	14/07/2023	11.205	0.685	
MW166	4/09/2023	11.235	0.655	
MW171	7/08/2017	28.68	0.558	sampled at 29.7
MW171	18/09/2017	28.855	0.383	
MW171	19/10/2017	28.82	0.418	
MW171	15/11/2017	28.86	0.378	
MW171	7/12/2017	28.87	0.368	
MW171	16/01/2018	28.88	0.358	
MW171	30/10/2019	28.924	0.314	
MW171	1/04/2020	28.55	0.688	
MW171	21/07/2020	28.48	0.758	
MW171	22/09/2020	31.5	-2.262	
MW171	22/09/2020	31.5	-2.262	
MW171	14/12/2020	28.55	0.688	
MW171	15/03/2021	28.55	0.688	Cloudy, sulfur odour
MW171	10/06/2021	28.392	0.846	
MW171	30/08/2021	28.6	0.638	
MW171	15/11/2021	28.789	0.449	
MW171	16/11/2021	28.6	0.638	
MW171	10/01/2022	28.64	0.598	
MW171	15/03/2022	28.451	0.787	
MW171	5/05/2022	28.53	0.708	Unable to get total depth as well is blocked by redeployed hydrasleeve
MW171	7/06/2022	28.341	0.897	
MW171	5/09/2022	28.538	0.7	
MW171	15/11/2022	28.91	0.328	LNAPL at observed 3.641
MW171	12/12/22	28.694	0.544	
MW171	13/03/2023	28.325	0.913	
MW171	9/05/2023	28.517	0.721	Monument, Good condition, Yellow stick up
MW171	6/06/2023	28.58	0.658	
MW171	14/07/2023	28.72	0.518	rusty blue monument, fair condition

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW171	4/09/2023	28.76	0.478	
MW172	7/08/2017	16.3	0.472	sampled at 17.3
MW172	11/11/2019	16.438	0.334	Could not get bladder pump or bailer down. Likely blocked by tree roots, difficult to get interface probe down as well (frequently stuck)
MW172	22/11/2019	16.521	0.251	
MW172	9/01/2020			Dry, stickup next to well was 19.8 deep and only had water at bottom of well.
MW172	1/04/2020			Dry
MW172	21/07/2020			DRY
MW172	22/09/2020			
MW172	22/09/2020			
MW172	14/12/2020			DRY
MW172	15/03/2021			Dry
MW172	10/06/2021			Dry
MW172	30/08/2021			Dry
MW172	16/11/2021			Dry
MW172	10/01/2022			Dry
MW172	15/03/2022			
MW172	8/06/2022	16.32	0.452	
MW172	6/09/2022	16.357	0.415	
MW172	12/12/22	16.474	0.298	
MW172	13/03/2023	16.415	0.357	
MW172	6/06/2023	16.22	0.552	
MW172	4/09/2023			Not accessed due to risk
MW173	9/08/2017	9.575	0.505	sampled at 10.57
MW173	18/09/2017	10.72	-0.64	
MW173	19/10/2017	9.665	0.415	low flow
MW173	15/11/2017	9.69	0.39	
MW173	7/12/2017	9.7	0.38	
MW173	16/01/2018	9.75	0.33	
MW173	15/11/2019	9.73	0.35	
MW173	16/01/2020	8.8	1.28	
MW173	31/03/2020	9.4	0.68	
MW173	22/07/2020	9.53	0.55	
MW173	22/09/2020			DRY
MW173	16/12/2020			DRY
MW173	16/03/2021	9.595	0.485	Clear
MW173	10/06/2021	9.471	0.609	
MW173	30/08/2021	11.11	-1.03	Dry
MW173	15/11/2021	9.696	0.384	
MW173	16/11/2021	11.11	-1.03	Dry
MW173	10/01/2022	11.11	-1.03	Dry
MW173	15/03/2022	9.53	0.55	
MW173	4/05/2022	9.559	0.521	Silver monument
MW173	8/06/2022	9.5	0.58	
MW173	5/09/2022	9.599	0.481	
MW173	18/11/2022	9.706	0.374	
MW173	12/12/22	9.695	0.385	
MW173	13/03/2023	9.614	0.466	
MW173	9/05/2023	9.574	0.506	Monument, Good condition, Large steel collar.
MW173	6/06/2023	9.387	0.693	
MW173	14/07/2023	9.558	0.522	monument, PVC height 0.44 m
MW173	4/09/2023	9.63	0.45	
MW193	8/08/2017	11.23	0.63	sampled at 12.23
MW193	18/09/2017	11.36	0.5	
MW193	19/10/2017	11.32	0.54	low flow
MW193	15/11/2017	11.35	0.51	
MW193	7/12/2017	11.375	0.485	
MW193	16/01/2018	11.38	0.48	
MW193	28/10/2019	11.465	0.395	
MW193	8/01/2020	11.4	0.46	Bore not labelled
MW193	31/03/2020	11.19	0.67	
MW193	15/07/2020	11.1	0.76	
MW193	21/09/2020	13.5	-1.64	
MW193	21/09/2020	13.5	-1.64	
MW193	16/12/2020	11.3	0.56	
MW193	16/03/2021	11.8	0.06	Clear
MW193	10/06/2021	11.13	0.73	
MW193	30/08/2021	11.31	0.55	
MW193	16/11/2021	11.31	0.55	
MW193	10/01/2022	11.289	0.571	Grey slight odour and quite turbid
MW193	15/03/2022	11.205	0.655	
MW193	7/06/2022	10.842	1.018	
MW193	5/09/2022	11.249	0.611	
MW193	12/12/22	11.394	0.466	
MW193	13/03/2023	11.31	0.55	
MW193	9/05/2023	11.22	0.64	
MW193	6/06/2023	11.037	0.823	
MW193	4/09/2023	11.28	0.58	
MW195D	9/08/2017	3.915	0.448	sampled at 13
MW195D	28/10/2019	4.175	0.188	
MW195D	8/01/2020	4.34	0.023	
MW195D	31/03/2020	4.184	0.179	
MW195D	15/07/2020	4	0.363	
MW195D	21/09/2020	4.234	0.129	
MW195D	21/09/2020	4.234	0.129	
MW195D	16/12/2020	4.23	0.133	
MW195D	16/03/2021	4.17	0.193	Clear
MW195D	9/06/2021	4.055	0.308	
MW195D	30/08/2021	4.27	0.093	
MW195D	15/11/2021	4.07	0.293	
MW195D	16/11/2021	4.27	0.093	
MW195D	10/01/2022	4.26	0.103	
MW195D	15/03/2022	4.129	0.234	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW195D	4/05/2022	3.925	0.438	Blue rusted monument
MW195D	7/06/2022	3.53	0.833	
MW195D	5/09/2022	4.146	0.217	
MW195D	18/11/2022	4.083	0.28	
MW195D	12/12/22	4.308	0.055	
MW195D	13/03/2023	4.142	0.221	
MW195D	9/05/2023	3.88	0.483	Monument, Good condition, Steel stick up. Yellow top and Hi-Vis band.
MW195D	6/06/2023	3.958	0.405	
MW195D	14/07/2023	3.913	0.45	rusted blue monument
MW195D	4/09/2023	3.99	0.373	
MW195S	9/08/2017	4.13	0.441	sampled at 4.5
MW195S	18/09/2017	4.274	0.297	Abundant roots present, blockage at 5.394 mbtoc
MW195S	19/10/2017	4.24	0.331	ROOTLETS PRESENT
MW195S	15/11/2017	4.265	0.306	Some roots present, no odour staining
MW195S	7/12/2017	4.27	0.301	SL ORGANIC ODOUR, TANNIN APPEARANCE
MW195S	16/01/2018	4.294	0.277	SL ORGANIC ODOUR, TANNIN APPEARANCE
MW195S	6/11/2019	6.5	-1.929	Dry
MW195S	8/01/2020	4.31	0.261	Bore labelled MW292_I
MW195S	31/03/2020	4.16	0.411	
MW195S	15/07/2020	4	0.571	
MW195S	21/09/2020	4.186	0.385	
MW195S	21/09/2020	4.186	0.385	
MW195S	16/12/2020	4.185	0.386	
MW195S	16/03/2021	3.8	0.771	Clear
MW195S	9/06/2021	4.055	0.516	
MW195S	30/08/2021	4.17	0.401	
MW195S	15/11/2021	4.213	0.358	
MW195S	16/11/2021	4.17	0.401	
MW195S	10/01/2022	4.21	0.361	
MW195S	15/03/2022	4.075	0.496	
MW195S	4/05/2022	4.135	0.436	
MW195S	7/06/2022	3.487	1.084	
MW195S	5/09/2022	4.09	0.481	
MW195S	15/11/2022			Damaged/bent and blocked. Unable to sample or accurately gauge due to obstructions
MW195S	12/12/22	4.26	0.311	
MW195S	13/03/2023	4.205	0.366	
MW195S	8/05/2023			Dry
MW195S	6/06/2023	3.405	1.166	
MW195S	4/09/2023			Dry
MW196	8/08/2017	12.456	0.294	sampled at 13.70
MW196	29/10/2019	12.67	0.08	
MW196	16/01/2020	13.9	-1.15	
MW196	2/04/2020	12.504	0.246	Bore labelled as MB52
MW196	22/07/2020	12.4	0.35	
MW196	24/09/2020	12.535	0.215	
MW196	24/09/2020	12.535	0.215	
MW196	16/12/2020	12.5	0.25	
MW196	16/03/2021			DRY
MW196	10/06/2021	12.36	0.39	Hand bailed
MW196	30/08/2021	12.44	0.31	
MW196	16/11/2021	12.44	0.31	
MW196	14/03/2022	12.422	0.328	
MW196	7/06/2022			Dry
MW196	6/09/2022	12.376	0.374	
MW196	13/12/22	12.543	0.207	
MW196	13/03/2023	12.48	0.27	
MW196	6/06/2023	12.38	0.37	
MW196	14/07/2023	12.425	0.325	monument, PVC height 0.60 m
MW196	5/09/2023			Dry
MW197	9/08/2017	1.68	0.6	sampleda at 2
MW197	18/09/2017	2.157	0.123	
MW197	19/10/2017	2.06	0.22	NO ODOUR&SHEEN
MW197	15/11/2017	2.277	0.003	no o/s
MW197	7/12/2017	2.31	-0.03	NO ODOUR, SL TANNIN APPEARANCE
MW197	16/01/2018	2.126	0.154	NO ODOUR, SL TANNIN APPEARANCE
MW197	9/01/2020			Bore damaged by fallen tree- bent, could not put hydrasleeve down
MW197	31/03/2020	2.1	0.18	
MW197	15/07/2020	1.93	0.35	Not enough water to take readings
MW197	24/09/2020			
MW197	15/12/2020			Dry
MW197	16/03/2021	2.015	0.265	Clear
MW197	9/06/2021	1.91	0.37	
MW197	1/09/2021	2.001	0.279	
MW197	10/01/2022			Dry
MW197	14/03/2022	2.04	0.24	
MW197	7/06/2022	2.061	0.219	
MW197	5/09/2022	1.985	0.295	Eoh 2.052mbtoc
MW197	12/12/22	2.305	-0.025	
MW197	14/03/2023	2.187	0.093	
MW197	7/06/2023	1.89	0.39	
MW197	14/07/2023	2.063	0.217	white casing only, PVC height 0.82 m
MW197	5/09/2023			Dry/blocked, unable to clear with steel bailer
MW199	8/08/2017	11.54	0.26	sampled at 12.54
MW199	18/09/2017	11.625	0.175	
MW199	19/10/2017	11.6	0.2	low flow
MW199	15/11/2017	11.61	0.19	
MW199	7/12/2017	11.615	0.185	
MW199	16/01/2018	11.665	0.135	
MW199	29/10/2019	11.74	0.06	
MW199	8/01/2020	11.4	0.4	
MW199	31/03/2020	8.65	3.15	
MW199	15/07/2020	11.14	0.66	
MW199	21/09/2020	11.474	0.326	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW199	21/09/2020	11.474	0.326	
MW199	16/12/2020	11.27	0.53	
MW199	16/03/2021			blocked less than 1 metre
MW199	9/06/2021			Well banded at approx 1.5m, unable to fix with steel bailer
MW199	30/08/2021	11.26	0.54	
MW199	16/11/2021	11.26	0.54	
MW199	10/01/2022	11.43	0.37	
MW199	17/03/2022	11.39	0.41	
MW199	7/06/2022	10.571	1.229	
MW199	5/09/2022	11.344	0.456	
MW199	12/12/22	11.469	0.331	
MW199	13/03/2023	11.548	0.252	
MW199	6/06/2023	11.334	0.466	
MW199	14/07/2023	11.235	0.565	
MW199	5/09/2023			Blocked/bent casing BGL
MW200	9/08/2017	1.635	0.435	sampled at 2
MW200	18/09/2017	1.733	0.337	
MW200	19/10/2017	2.115	-0.045	NO ODOUR&SHEEN
MW200	15/11/2017	1.893	0.177	no o/s
MW200	7/12/2017	1.975	0.095	NO ODOUR, SL TANNIN APPEARANCE
MW200	16/01/2018	1.768	0.302	NO ODOUR, SL TANNIN APPEARANCE
MW200	11/11/2019	1.995	0.075	
MW200	9/01/2020	1.98	0.09	
MW200	31/03/2020	1.67	0.4	
MW200	15/07/2020	1.84	0.23	Bore survey may be required
MW200	24/09/2020	1.125	0.945	
MW200	24/09/2020	1.125	0.945	
MW200	15/12/2020	2.07	0	
MW200	16/03/2021	1.82	0.25	Clear
MW200	9/06/2021	1.675	0.395	
MW200	1/09/2021	1.856	0.214	
MW200	16/11/2021	1.942	0.128	
MW200	10/01/2022	2.06	0.01	
MW200	14/03/2022	1.84	0.23	
MW200	4/05/2022	2.203	-0.133	PVC only, well is small diameter peri located near metal square sign on beach
MW200	7/06/2022	1.879	0.191	
MW200	5/09/2022	1.846	0.224	
MW200	17/11/2022	2.025	0.045	
MW200	12/12/22	2.23	-0.16	
MW200	14/03/2023	1.998	0.072	
MW200	9/05/2023	1.75	0.32	Monument, Fair condition , Blue stick up. Rusty.
MW200	7/06/2023	1.72	0.35	
MW200	14/07/2023	1.84	0.23	white PVC casing only, cap, bailer and rope
MW200	5/09/2023	2.03	0.04	
MW202	9/08/2017	1.51	0.61	sampled at 2.0
MW202	18/09/2017	1.841	0.279	No bore cap resulted in organic matter (leaf litter) present within water column
MW202	19/10/2017	1.91	0.21	ROOTLETS PRESENT
MW202	15/11/2017	1.952	0.168	no o/s
MW202	7/12/2017	2.028	0.092	NO ODOUR, SL TANNIN APPEARANCE
MW202	16/01/2018	1.772	0.348	NO ODOUR, SL TANNIN APPEARANCE
MW202	17/01/2020			Not found
MW202	31/03/2020	1.71	0.41	
MW202	22/07/2020	1.62	0.5	
MW202	21/09/2020	1.92	0.2	
MW202	21/09/2020	1.92	0.2	
MW202	16/12/2020	1.95	0.17	
MW202	15/03/2021	1.82	0.3	Clear
MW202	10/06/2021	1.385	0.735	
MW202	30/08/2021	1.85	0.27	
MW202	16/11/2021	1.85	0.27	
MW202	12/01/2022	1.87	0.25	Hand bailed hydrasleeve broke upon retrieval.
MW202	8/06/2022	1.72	0.4	
MW202	5/09/2022	1.4	0.72	
MW202	12/12/22	1.98	0.14	
MW202	13/03/2023	1.77	0.35	
MW202	7/06/2023	1.532	0.588	
MW202	5/09/2023	1.86	0.26	
MW203	9/08/2017	4.54	6.315	sampled at 11.54
MW203	8/11/2019	10.705	0.15	
MW203	8/01/2020	10.73	0.125	
MW203	31/03/2020	10.61	0.245	
MW203	15/07/2020	10.42	0.435	
MW203	22/09/2020	10.56	0.295	
MW203	22/09/2020	10.56	0.295	
MW203	16/12/2020	10.605	0.25	
MW203	16/03/2021	10.52	0.335	Clear
MW203	9/06/2021	10.44	0.415	
MW203	30/08/2021	10.43	0.425	
MW203	16/11/2021	10.43	0.425	
MW203	10/01/2022	10.52	0.335	
MW203	17/03/2022	10.54	0.315	
MW203	7/06/2022	10.41	0.445	
MW203	6/09/2022	10.38	0.475	
MW203	12/12/22	10.54	0.315	
MW203	13/03/2023	10.58	0.275	
MW203	6/06/2023	10.446	0.409	
MW203	14/07/2023	10.458	0.397	white casing only, PVC height 0.52 m
MW203	5/09/2023	10.55	0.305	
MW214	2/08/2017	7.76	0.315	sampled at 8.76
MW214	10/01/2020			Dry
MW214	31/03/2020			Bore Dry
MW214	22/07/2020			Dry
MW214	24/09/2020			

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW214	24/09/2020			
MW214	15/12/2020			DRY
MW214	18/03/2021			Dry
MW214	9/06/2021			Dry
MW214	1/09/2021	7.64	0.435	
MW214	16/11/2021	7.64	0.435	Bore blocked by fine sedimend. Unblocked and hand bailed
MW214	7/06/2022	7.67	0.405	
MW214	6/09/2022	7.545	0.53	
MW214	13/12/22	7.932	0.143	
MW214	14/03/2023	7.726	0.349	
MW214	8/06/2023	7.608	0.467	
MW214	4/09/2023	7.66	0.415	
MW215	2/08/2017	3.555	0.239	Sampled 4.55
MW215	10/01/2020			Dry
MW215	31/03/2020			Bore Dry 3.34m
MW215	22/07/2020			Dry
MW215	22/07/2020			Dry
MW215	24/09/2020			
MW215	24/09/2020			
MW215	15/12/2020			Dry
MW215	18/03/2021			Dry
MW215	9/06/2021			Dry at 3.11
MW215	1/09/2021	3.416	0.378	
MW215	7/06/2022	3.46	0.334	
MW215	6/09/2022	3.308	0.486	
MW215	13/12/22	3.702	0.092	
MW215	14/03/2023	3.542	0.252	
MW215	8/06/2023	3.429	0.365	
MW215	4/09/2023	3.47	0.324	
MW216	2/08/2017	7.945	0.384	sampled at 8.5
MW216	11/09/2017	7.91	0.419	
MW216	16/10/2017	7.905	0.424	
MW216	17/11/2017	7.92	0.409	
MW216	5/12/2017	7.97	0.359	NO O/S
MW216	15/01/2018	8.07	0.259	NO O/S
MW216	19/12/2019	7.9	0.429	
MW216	31/03/2020	7.905	0.424	
MW216	22/07/2020			
MW216	24/09/2020			
MW216	15/12/2020	7.91	0.419	
MW216	18/03/2021	8.93	-0.601	Clear
MW216	9/06/2021	7.752	0.577	
MW216	31/08/2021	7.909	0.42	
MW216	16/03/2022	7.8	0.529	
MW216	7/06/2022	7.87	0.459	
MW216	5/09/2022	7.848	0.481	
MW216	13/12/22	8.069	0.26	
MW216	14/03/2023	7.944	0.385	
MW216	8/06/2023	7.825	0.504	
MW216	4/09/2023	7.87	0.459	
MW217	2/08/2017	8.365	0.482	sampled at 8.80
MW217	11/09/2017	8.4	0.447	
MW217	16/10/2017	8.43	0.417	
MW217	17/11/2017	8.445	0.402	
MW217	5/12/2017	8.45	0.397	NO O/S
MW217	15/01/2018	8.56	0.287	NO O/S
MW217	18/12/2019	8.49	0.357	
MW217	31/03/2020	8.438	0.409	Hydrosleeve broken - hand bailed
MW217	22/07/2020	8.31	0.537	
MW217	24/09/2020	8.458	0.389	
MW217	24/09/2020	8.458	0.389	
MW217	15/12/2020	8.42	0.427	
MW217	18/03/2021	8.43	0.417	Clear
MW217	9/06/2021	8.28	0.567	
MW217	31/08/2021	8.355	0.492	
MW217	16/11/2021	8.355	0.492	
MW217	18/11/2021	8.384	0.463	
MW217	13/01/2022	8.455	0.392	Cloudy no odour
MW217	17/03/2022	8.35	0.497	
MW217	8/06/2022	8.93	-0.083	
MW217	8/09/2022	8.255	0.592	
MW217	16/11/2022	8.472	0.375	
MW217	13/12/22	8.5	0.347	
MW217	15/03/2023	8.47	0.377	
MW217	8/06/2023	8.23	0.617	
MW217	14/07/2023	8.345	0.502	monument
MW217	4/09/2023	8.838	0.009	
MW220	2/08/2017	6.49		sampled at 7.49
MW220	11/09/2017	6.62		
MW220	16/10/2017	6.7		
MW220	17/11/2017	6.715		
MW220	5/12/2017	6.706		NO O/S
MW220	15/01/2018	6.777		NO O/S
MW220	18/12/2019			Dry
MW220	31/03/2020			Bore Dry
MW220	22/07/2020	6.52		Blocked w roots could not sample
MW220	24/09/2020			
MW220	24/09/2020			
MW220	15/12/2020			DRY
MW220	18/03/2021			Dry
MW220	9/06/2021	6.545		Only PFAS Sample collected. not enough water
MW220	31/08/2021			Dry
MW220	16/11/2021			Dry

Table 9 - Groundwater Gauging data

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW220	18/11/2021	6.658		Blocked with roots
MW220	13/01/2022	6.7		Lots of roots present. Organic smell.
MW220	17/03/2022			
MW220	8/06/2022	6.86		
MW220	8/09/2022	5.13		
MW220	16/11/2022	6.674		
MW220	13/12/22	6.68		
MW220	15/03/2023			
MW220	8/06/2023	6.23		
MW220	14/07/2023	6.612		silver monument
MW220	4/09/2023	8.63		
MW224	9/08/2017	12.925	0.447	sampled at 13.93
MW224	18/12/2019	13.13	0.242	
MW224	31/03/2020	13.043	0.329	
MW224	22/07/2020	12.89	0.482	
MW224	24/09/2020	13.011	0.361	
MW224	24/09/2020	13.011	0.361	
MW224	15/12/2020	13.06	0.312	
MW224	18/03/2021	12.95	0.422	Clear
MW224	9/06/2021	12.88	0.492	
MW224	31/08/2021	12.9	0.472	
MW224	16/11/2021	12.9	0.472	
MW224	13/01/2022	12.99	0.382	
MW224	17/03/2022	12.98	0.392	
MW224	8/06/2022	13.38	-0.008	
MW224	8/09/2022	12.25	1.122	
MW224	13/12/22	12.95	0.422	
MW224	15/03/2023	12.975	0.397	
MW224	8/06/2023	12.33	1.042	
MW224	14/07/2023	12.965	0.407	Silver monument
MW224	4/09/2023	12.99	0.382	
MW225	2/08/2017	3.94	0.126	sampled at 4.3
MW225	11/09/2017	3.85	0.216	
MW225	19/10/2017	3.92	0.146	NO ODOUR&SHEEN
MW225	17/11/2017	3.813	0.253	no o/s
MW225	5/12/2017	3.892	0.174	NO O/S
MW225	15/01/2018	3.971	0.095	NO O/S
MW225	10/01/2020			Dry
MW225	31/03/2020			Bore Dry
MW225	22/07/2020			DRY
MW225	24/09/2020			
MW225	24/09/2020			
MW225	15/12/2020			Dry
MW225	17/03/2021			Dry
MW225	9/06/2021			Dry
MW225	1/09/2021	3.85	0.216	
MW225	16/11/2021	3.85	0.216	Well blocked by fine sediment/sand. Unblocked and sampled with bailer
MW225	16/03/2022	3.69	0.376	
MW225	7/06/2022	3.75	0.316	
MW225	6/09/2022	3.66	0.406	
MW225	13/12/22	4.03	0.036	
MW225	14/03/2023	3.865	0.201	
MW225	8/06/2023	3.759	0.307	
MW225	14/07/2023	3.631	0.435	Gauged only
MW225	4/09/2023	3.87	0.196	
MW226	2/08/2017	1.75	-0.001	sampled at 2
MW226	11/09/2017	1.69	0.059	
MW226	19/10/2017	1.755	-0.006	NO ODOUR&SHEEN
MW226	17/11/2017	1.622	0.127	no o/s
MW226	5/12/2017	1.742	0.007	NO ODOUR, SL TANNIN APPEARANCE
MW226	15/01/2018	1.781	-0.032	NO ODOUR, SL TANNIN APPEARANCE
MW226	14/01/2020	1.9	-0.151	
MW226	2/04/2020	1.611	0.138	
MW226	21/07/2020	1.49	0.259	
MW226	22/09/2020	1.7	0.049	
MW226	22/09/2020	1.7	0.049	
MW226	15/12/2020	1.72	0.029	
MW226	17/03/2021	1.415	0.334	Clear,Yellow
MW226	10/06/2021	1.1	0.649	
MW226	31/08/2021	1.716	0.033	
MW226	16/03/2022	0.895	0.854	
MW226	7/06/2022	1.75	-0.001	
MW226	6/09/2022	1.48	0.269	
MW226	13/12/22	1.42	0.329	
MW226	14/03/2023	1.62	0.129	
MW226	8/06/2023	1.5	0.249	
MW226	14/07/2023	1.276	0.473	Gauged only
MW226	4/09/2023	1.66	0.089	
MW227	2/08/2017	2.85	0.111	3.1
MW227	11/09/2017	2.82	0.141	
MW227	19/10/2017	2.75	0.211	NO ODOUR&SHEEN
MW227	17/11/2017	2.829	0.132	no o/s
MW227	5/12/2017	2.844	0.117	NO ODOUR, SL TANNIN STAINING
MW227	15/01/2018	2.96	0.001	NO ODOUR, SL TANNIN STAINING
MW227	17/01/2020	4.2	-1.239	Not found
MW227	1/04/2020	2.795	0.166	
MW227	22/07/2020	2.705	0.256	
MW227	21/09/2020	2.77	0.191	
MW227	21/09/2020	2.77	0.191	
MW227	15/12/2020	2.78	0.181	
MW227	15/03/2021	2.8	0.161	Clear,Cloudy
MW227	10/06/2021	2.488	0.473	
MW227	31/08/2021	2.807	0.154	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW227	14/01/2022	2.88	0.081	
MW227	16/03/2022	2.702	0.259	
MW227	7/06/2022	2.73	0.231	
MW227	7/09/2022	2.61	0.351	
MW227	13/12/22	2.94	0.021	
MW227	14/03/2023	2.85	0.111	
MW227	8/06/2023	2.725	0.236	
MW227	14/07/2023	2.592	0.369	silver monument with HS
MW227	5/09/2023	2.795	0.166	
MW228	2/08/2017	2.15	0.08	sampled at 2.4
MW228	11/09/2017	2.115	0.115	
MW228	19/10/2017	2.195	0.035	NO ODOUR&SHEEN
MW228	17/11/2017	2.129	0.101	no o/s
MW228	5/12/2017	2.145	0.085	NO ODOUR, SL TANNIN STAINING
MW228	15/01/2018	2.268	-0.038	NO ODOUR, SL TANNIN STAINING
MW228	14/01/2020	3.75	-1.52	
MW228	1/04/2020	2.082	0.148	
MW228	22/07/2020	1.98	0.25	
MW228	21/09/2020	3.075	-0.845	
MW228	21/09/2020	3.075	-0.845	
MW228	15/12/2020	2.065	0.165	
MW228	15/03/2021	2.08	0.15	Cloudy,Clear,Brown
MW228	10/06/2021	1.675	0.555	
MW228	31/08/2021	2.086	0.144	
MW228	14/01/2022	2.17	0.06	
MW228	16/03/2022	2	0.23	
MW228	7/06/2022	1.92	0.31	
MW228	7/09/2022	1.893	0.337	
MW228	13/12/22	2.269	-0.039	
MW228	14/03/2023	2.13	0.1	
MW228	8/06/2023	1.945	0.285	
MW228	14/07/2023	1.808	0.422	silver monument with HS
MW228	5/09/2023	2.06	0.17	
MW233	8/08/2017	2.99	0.715	sampled at 3.5
MW233	13/09/2017	3.175	0.53	
MW233	19/10/2017	3.265	0.44	
MW233	21/11/2017	3.435	0.27	black suspsended solids, no o/s
MW233	5/12/2017	3.3	0.405	SUSPENDED SOLIDS
MW233	19/01/2018	2.78	0.925	SUSPENDED SOLIDS
MW233	12/11/2019	3.43	0.275	
MW233	8/01/2020	3.51	0.195	Tree roots
MW233	30/03/2020	3.38	0.325	
MW233	15/07/2020	2.9	0.805	
MW233	21/09/2020	3.045	0.66	
MW233	21/09/2020	3.045	0.66	
MW233	15/12/2020	3.36	0.345	
MW233	15/03/2021	3.18	0.525	Clear
MW233	9/06/2021	2.923	0.782	
MW233	30/08/2021	2.794	0.911	
MW233	8/11/2021	3.19	0.515	
MW233	10/01/2022	3.33	0.375	
MW233	17/03/2022	3.31	0.395	
MW233	3/05/2022	3.215	0.49	Silver monument. Well casing (metal top) broken but placed on top of pvc
MW233	8/06/2022	3.09	0.615	
MW233	6/09/2022	2.64	1.065	
MW233	15/11/2022	3.253	0.452	
MW233	13/12/22	3.26	0.445	
MW233	13/03/2023	3.355	0.35	
MW233	9/05/2023	3.042	0.663	Monument, Good condition
MW233	6/06/2023			No SWL recorded
MW233	4/09/2023			
MW236	8/08/2017	4.05	0.592	sampled at 4.5
MW236	13/09/2017	4.105	0.537	
MW236	19/10/2017	4.145	0.497	
MW236	21/11/2017	4.14	0.502	no o/s
MW236	5/12/2017	4.18	0.462	
MW236	19/01/2018	4.125	0.517	
MW236	11/10/2019	4.252	0.39	
MW236	16/01/2020			Dry
MW236	2/04/2020	4.176	0.466	
MW236	16/07/2020	4	0.642	
MW236	21/09/2020	4.14	0.502	
MW236	21/09/2020	4.14	0.502	
MW236	15/12/2020	4.18	0.462	
MW236	16/03/2021	4.08	0.562	Clear
MW236	10/06/2021	4.01	0.632	
MW236	31/08/2021	3.95	0.692	
MW236	8/11/2021	4.117	0.525	
MW236	16/11/2021	3.95	0.692	
MW236	10/01/2022	4.104	0.538	Hydrasleeve broke upon retrieval.
MW236	17/03/2022	5.66	-1.018	
MW236	3/05/2022	4.071	0.571	Gatic in good condition
MW236	7/06/2022	3.995	0.647	
MW236	6/09/2022	3.88	0.762	
MW236	15/11/2022	4.101	0.541	
MW236	13/12/22	4.13	0.512	Hydrasleeve didn't fill up
MW236	13/03/2023	5.66	-1.018	
MW236	10/05/2023	3.913	0.729	Monument, Good condition
MW236	6/06/2023	4.12	0.522	
MW236	5/09/2023	4.085	0.557	
MW238	4/08/2017	4.273	0.554	sampled at 5.77
MW238	13/09/2017	4.27	0.557	
MW238	19/10/2017	4.37	0.457	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW238	21/11/2017	4.44	0.387	
MW238	5/12/2017	4.46	0.367	
MW238	19/01/2018	4.39	0.437	
MW238	21/10/2019	4.49	0.337	
MW238	14/01/2020	4	0.827	
MW238	1/04/2020	4.38	0.447	
MW238	16/07/2020	4.315	0.512	
MW238	21/09/2020	4.39	0.437	
MW238	21/09/2020	4.39	0.437	
MW238	29/09/2020	4.383	0.444	
MW238	30/09/2020	4.374	0.453	
MW238	15/12/2020	4.505	0.322	
MW238	15/02/2021	4.476	0.351	
MW238	18/03/2021	4.45	0.377	Clear
MW238	10/06/2021	4.29	0.537	
MW238	31/08/2021	3.975	0.852	
MW238	16/11/2021	3.975	0.852	
MW238	12/01/2022	4.412	0.415	Clear no odour
MW238	9/06/2022	4.28	0.547	
MW238	6/09/2022	3.98	0.847	
MW238	13/12/22	4.385	0.442	
MW238	15/03/2023	4.47	0.357	
MW238	7/06/2023	4.31	0.517	
MW238	5/09/2023	4.31	0.517	
MW239	4/08/2017	3.485	0.545	sampled at 4.49
MW239	18/10/2019	3.695	0.335	
MW239	14/01/2020			Dry
MW239	1/04/2020			Bore dry
MW239	22/07/2020	3.505	0.525	Bore is damaged/bent.
MW239	21/09/2020	3.59	0.44	
MW239	21/09/2020	3.59	0.44	
MW239	29/09/2020	3.594	0.436	
MW239	1/10/2020	3.593	0.437	
MW239	15/12/2020	3.725	0.305	
MW239	15/02/2021	3.694	0.336	
MW239	18/03/2021	3.63	0.4	Clear
MW239	10/06/2021	3.511	0.519	
MW239	31/08/2021	3.26	0.77	
MW239	9/11/2021	3.5	0.53	
MW239	16/11/2021	3.26	0.77	
MW239	12/01/2022	3.634	0.396	Clear slight diesel odour
MW239	3/05/2022	3.626	0.404	PVC only with large sand/construction material stockpiles directly above well.
MW239	9/06/2022	3.5	0.53	
MW239	6/09/2022	3.2	0.83	Well buried in sand stockpile
MW239	11/11/2022	2.373	1.657	Well headworks buried by sand approx (0.3m), bore located behind sign. Sand infiltration evident, possible well collapse.
MW239	13/12/22	3.6	0.43	Bore under a sand stockpile, casing filling up with sand
MW239	15/03/2023	3.69	0.34	
MW239	9/05/2023	3.432	0.598	Flush-mount (Gatic), Good condition
MW239	7/06/2023	3.53	0.5	
MW239	5/09/2023	3.53	0.5	
MW240	4/08/2017	3.94	0.543	sampled at 4.940
MW240	21/10/2019	4.159	0.324	
MW240	14/01/2020	2.7	1.783	
MW240	1/04/2020	4.18	0.303	
MW240	16/07/2020	3.99	0.493	
MW240	21/09/2020	4.035	0.448	
MW240	21/09/2020	4.035	0.448	
MW240	29/09/2020	4.036	0.447	
MW240	30/09/2020	4.03	0.453	
MW240	15/12/2020	4.19	0.293	
MW240	15/02/2021	4.137	0.346	
MW240	18/03/2021	4.7	-0.217	Clear
MW240	10/06/2021	3.94	0.543	
MW240	31/08/2021	3.67	0.813	
MW240	16/11/2021	3.67	0.813	
MW240	12/01/2022	4.068	0.415	
MW240	9/06/2022	3.935	0.548	
MW240	6/09/2022	3.657	0.826	
MW240	13/12/22	4.04	0.443	
MW240	15/03/2023	4.11	0.373	
MW240	7/06/2023	3.95	0.533	
MW240	5/09/2023	3.97	0.513	
MW242	7/08/2017	3.05	0.489	sampleda at 3.4
MW242	18/10/2019	3.238	0.301	
MW242	8/01/2020	3.359	0.18	
MW242	30/03/2020	3.934	-0.395	
MW242	16/07/2020	3.025	0.514	
MW242	21/09/2020	3.125	0.414	
MW242	21/09/2020	3.125	0.414	
MW242	29/09/2020	3.095	0.444	
MW242	1/10/2020	3.105	0.434	
MW242	15/12/2020	3.265	0.274	
MW242	16/02/2021	3.22	0.319	
MW242	18/03/2021	3.43	0.109	Clear
MW242	9/06/2021	3.03	0.509	
MW242	31/08/2021	2.755	0.784	
MW242	9/11/2021	3.038	0.501	
MW242	12/01/2022	3.17	0.369	
MW242	17/03/2022	3.22	0.319	
MW242	3/05/2022	3.145	0.394	Gatic
MW242	8/06/2022	3.03	0.509	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW242	6/09/2022	2.745	0.794	
MW242	14/11/2022	3.089	0.45	
MW242	13/12/22	3.14	0.399	
MW242	15/03/2023	3.23	0.309	
MW242	9/05/2023	2.978	0.561	Flush-mount (Gatic), Good condition
MW242	6/06/2023	3.01	0.529	
MW242	4/09/2023	3.085	0.454	
MW243	13/09/2017	3.97	0.922	
MW243	20/10/2017	4.06	0.832	
MW243	21/11/2017	4.105	0.787	no o/s
MW243	5/12/2017	4.125	0.767	
MW243	19/01/2018	4.035	0.857	
MW243	24/10/2019	4.621	0.271	
MW243	14/01/2020	4.63	0.262	
MW243	1/04/2020	4.6	0.292	
MW243	16/07/2020	4.39	0.502	
MW243	21/09/2020	4.47	0.422	
MW243	21/09/2020	4.47	0.422	
MW243	29/09/2020	4.454	0.438	
MW243	30/09/2020	4.455	0.437	
MW243	15/12/2020	4.57	0.322	
MW243	15/02/2021	4.57	0.322	
MW243	15/02/2021	4.57	0.322	
MW243	18/03/2021	4.5	0.392	
MW243	10/06/2021	4.366	0.526	
MW243	31/08/2021	4.135	0.757	
MW243	9/11/2021	4.399	0.493	
MW243	16/11/2021	4.135	0.757	
MW243	12/01/2022	4.499	0.393	
MW243	3/05/2022	4.477	0.415	Gatic
MW243	9/06/2022	4.24	0.652	
MW243	6/09/2022	4.12	0.772	
MW243	14/11/2022	4.428	0.464	
MW243	13/12/22	4.48	0.412	
MW243	15/03/2023	4.55	0.342	
MW243	9/05/2023	4.297	0.595	Flush-mount (Gatic), Good condition
MW243	7/06/2023	4.33	0.562	
MW243	5/09/2023	4.4	0.492	
MW245	4/08/2017	3.28	1.271	sampled at 4.28
MW245	13/09/2017	3.345	1.206	
MW245	20/10/2017	3.445	1.106	
MW245	21/11/2017	3.505	1.046	slight chemical odour, no sheen
MW245	5/12/2017	3.5	1.051	
MW245	19/01/2018	3.34	1.211	
MW245	21/10/2019	4.26	0.291	
MW245	14/01/2020	4.8	-0.249	
MW245	1/04/2020	4.28	0.271	
MW245	16/07/2020	3.985	0.566	
MW245	21/09/2020	4.12	0.431	
MW245	21/09/2020	4.12	0.431	
MW245	29/09/2020	4.084	0.467	
MW245	30/09/2020	3.11	1.441	
MW245	15/12/2020	4.235	0.316	
MW245	15/02/2021	4.226	0.325	
MW245	15/02/2021	4.226	0.325	
MW245	18/03/2021	4.17	0.381	Black, hydrocarbon odour
MW245	10/06/2021	3.98	0.571	
MW245	31/08/2021	3.79	0.761	
MW245	9/11/2021	4.062	0.489	
MW245	16/11/2021	3.79	0.761	
MW245	12/01/2022	4.18	0.371	
MW245	3/05/2022	4.156	0.395	Silver monument
MW245	9/06/2022	4.042	0.509	
MW245	6/09/2022	3.715	0.836	
MW245	14/11/2022	4.08	0.471	
MW245	13/12/22	4.15	0.401	
MW245	15/03/2023	4.23	0.321	
MW245	9/05/2023	4.976	-0.425	Monument, Good condition, Water Level has been flagged as potentially erroneous
MW245	7/06/2023	3.88	0.671	
MW245	5/09/2023	4.08	0.471	
MW249	7/08/2017	4.788	0.439	sampled at 5.1
MW249	13/09/2017	4.81	0.417	
MW249	20/10/2017	4.91	0.317	
MW249	21/11/2017	4.98	0.247	
MW249	5/12/2017	5	0.227	
MW249	19/01/2018	4.87	0.357	
MW249	15/11/2019	5.062	0.165	
MW249	8/01/2020	5.14	0.087	
MW249	30/03/2020	5.036	0.191	
MW249	16/07/2020	4.8	0.427	
MW249	21/09/2020	4.885	0.342	
MW249	21/09/2020	4.885	0.342	
MW249	29/09/2020	4.892	0.335	
MW249	1/10/2020	4.886	0.341	
MW249	15/12/2020	5.015	0.212	
MW249	16/02/2021	4.992	0.235	
MW249	16/02/2021	4.992	0.235	
MW249	15/03/2021	4.93	0.297	Black
MW249	9/06/2021	4.973	0.254	
MW249	31/08/2021	4.57	0.657	
MW249	12/01/2022	4.95	0.277	No odour. Clayey orange in colour
MW249	17/03/2022	4.99	0.237	
MW249	8/06/2022	4.795	0.432	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW249	6/09/2022	4.572	0.655	
MW249	13/12/22	4.92	0.307	
MW249	13/03/2023	4.995	0.232	
MW249	6/06/2023	4.85	0.377	
MW249	4/09/2023	4.85	0.377	
MW255	4/08/2017	4.05	0.559	
MW255	13/09/2017	4.121	0.488	
MW255	20/10/2017	4.16	0.449	NO ODOUR&SHEEN
MW255	21/11/2017	4.147	0.462	
MW255	8/12/2017	4.19	0.419	
MW255	19/01/2018	4.136	0.473	
MW255	19/12/2019			Dry
MW255	2/04/2020			BORE DRY
MW255	16/07/2020	4.015	0.594	
MW255	22/09/2020	4.1	0.509	
MW255	22/09/2020	4.1	0.509	
MW255	16/12/2020	4.18	0.429	
MW255	17/03/2021	4.1	0.509	
MW255	10/06/2021	4.03	0.579	
MW255	31/08/2021	3.99	0.619	
MW255	16/11/2021	3.99	0.619	Murky
MW255	10/01/2022	4.15	0.459	Clear no odour
MW255	17/03/2022	4.12	0.489	
MW255	9/06/2022	4.005	0.604	
MW255	6/09/2022	6	-1.391	SWL below hydrasleeve, not recorded
MW255	13/12/22	4.152	0.457	
MW255	13/03/2023	4.16	0.449	
MW255	6/06/2023	4.23	0.379	
MW255	14/07/2023	4.041	0.568	
MW255	5/09/2023	4.11	0.499	
MW256	4/08/2017	3.3	0.54	sampled at 4
MW256	13/09/2017	3.346	0.494	
MW256	20/10/2017	3.39	0.45	NO ODOUR&SHEEN
MW256	21/11/2017	3.378	0.462	no o/s
MW256	8/12/2017	3.42	0.42	
MW256	19/01/2018	3.365	0.475	
MW256	8/01/2020	3.56	0.28	Root blockage at 3m could not sample
MW256	30/03/2020	3.418	0.422	
MW256	16/07/2020	3.24	0.6	
MW256	22/09/2020	3.34	0.5	
MW256	22/09/2020	3.34	0.5	
MW256	14/12/2020	3.4	0.44	
MW256	17/03/2021	3.345	0.495	
MW256	10/06/2021	3.225	0.615	
MW256	31/08/2021	3.2	0.64	
MW256	16/11/2021	3.2	0.64	
MW256	10/01/2022	3.36	0.48	
MW256	17/03/2022	3.34	0.5	
MW256	9/06/2022	3.225	0.615	
MW256	6/09/2022	3.09	0.75	
MW256	13/12/22	3.37	0.47	
MW256	13/03/2023	3.23	0.61	
MW256	6/06/2023	3.26	0.58	
MW256	5/09/2023	3.335	0.505	
MW257	4/08/2017	3.315	0.491	sampled at 4
MW257	13/09/2017	3.367	0.439	
MW257	20/10/2017	3.4	0.406	NO ODOUR&SHEEN
MW257	21/11/2017	3.382	0.424	no o/s
MW257	8/12/2017	3.433	0.373	NO O/S
MW257	19/01/2018	3.361	0.445	NO O/S
MW257	19/12/2019	3.47	0.336	
MW257	2/04/2020	3.416	0.39	SWL TAKEN AFTER SAMPLING - INACCURATE READING
MW257	16/07/2020	3.245	0.561	
MW257	22/09/2020	3.37	0.436	
MW257	22/09/2020	3.37	0.436	
MW257	16/12/2020	3.39	0.416	
MW257	18/03/2021	3.82	-0.014	
MW257	9/06/2021	5.268	-1.462	
MW257	31/08/2021	3.225	0.581	
MW257	16/11/2021	3.225	0.581	
MW257	10/01/2022	3.35	0.456	
MW257	17/03/2022	3.34	0.466	
MW257	9/06/2022	3.235	0.571	
MW257	6/09/2022	5.7	-1.894	SWL below hydrasleeve, not recorded
MW257	13/12/22	3.39	0.416	
MW257	13/03/2023	3.39	0.416	
MW257	6/06/2023	3.225	0.581	
MW257	14/07/2023	3.254	0.552	flush mount corner of fence and brick wall, plastic cover
MW257	5/09/2023	3.34	0.466	
MW258	4/08/2017	3.565	0.478	sampled at 4
MW258	13/09/2017	3.621	0.422	
MW258	20/10/2017	3.645	0.398	NO ODOUR&SHEEN
MW258	21/11/2017	3.623	0.42	no o/s
MW258	8/12/2017	3.68	0.363	NO ODOUR, SL TANNIN APPEARANCE
MW258	19/01/2018	3.597	0.446	NO ODOUR, SL TANNIN APPEARANCE
MW258	19/12/2019			Dry
MW258	2/04/2020			BORE DRY
MW258	16/07/2020			DRY
MW258	22/09/2020			
MW258	22/09/2020			
MW258	16/12/2020			Dry
MW258	18/03/2021			Dry. Potentially blocked by tree roots
MW258	10/06/2021			DRY

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW258	31/08/2021			Dry
MW258	16/11/2021			Dry
MW258	10/01/2022			Blocked at 3.69
MW258	17/03/2022			
MW258	8/06/2022	3.68	0.363	Unblocked
MW258	6/09/2022			SWL below hydrasleeve. not recorded.
MW258	13/12/22	3.65	0.393	
MW258	13/03/2023	3.57	0.473	
MW258	6/06/2023	3.472	0.571	
MW258	14/07/2023	3.495	0.548	flush mount, plastic cover
MW258	5/09/2023	3.58	0.463	
MW259	4/08/2017	3.34	0.46	sampled at 3.6
MW259	13/09/2017	3.39	0.41	
MW259	20/10/2017	3.41	0.39	NO ODOUR&SHEEN
MW259	21/11/2017	3.391	0.409	no o/s
MW259	8/12/2017	3.449	0.351	NO ODOUR, V SL TANNIN APPEARANCE
MW259	19/01/2018	3.371	0.429	NO ODOUR, V SL TANNIN APPEARANCE
MW259	19/12/2019			Dry
MW259	2/04/2020	3.321	0.479	OBSTRUCTION IN BORE AT 3.4M - UNABLE TO SAMPLE VIA HAND BAILER
MW259	16/07/2020	3.215	0.585	
MW259	22/09/2020	3.39	0.41	
MW259	22/09/2020	3.39	0.41	
MW259	16/12/2020	3.34	0.46	
MW259	18/03/2021	3.32	0.48	
MW259	10/06/2021	3.22	0.58	
MW259	31/08/2021	3.65	0.15	
MW259	16/11/2021	3.65	0.15	Roots
MW259	11/01/2022	3.375	0.425	No odour, clear. Lots of roots
MW259	17/03/2022	3.34	0.46	
MW259	9/06/2022	3.24	0.56	
MW259	6/09/2022	3.142	0.658	
MW259	13/12/22	3.41	0.39	
MW259	13/03/2023	3.28	0.52	
MW259	6/06/2023	3.23	0.57	
MW259	5/09/2023	3.63	0.17	
MW268	1/08/2017	3.9	0.156	sampled at 4.9
MW268	19/09/2017	3.911	0.145	
MW268	16/10/2017	3.77	0.286	NO ODOUR&SHEEN
MW268	17/11/2017	3.845	0.211	
MW268	7/12/2017	4.058	-0.002	NO ODOUR, SL TANNIN APPEARANCE
MW268	16/01/2018	3.884	0.172	NO ODOUR, SL TANNIN APPEARANCE
MW268	12/11/2019	4.039	0.017	
MW268	19/12/2019	3.87	0.186	
MW268	30/03/2020	3.78	0.276	
MW268	21/07/2020	3.78	0.276	
MW268	21/09/2020	3.03	1.026	
MW268	21/09/2020	3.03	1.026	
MW268	14/12/2020	2.87	1.186	
MW268	16/03/2021	3.75	0.306	
MW268	9/06/2021	3.664	0.392	
MW268	31/08/2021	3.91	0.146	
MW268	11/11/2021	3.908	0.148	
MW268	16/11/2021	3.91	0.146	
MW268	11/01/2022	3.905	0.151	
MW268	17/03/2022	3.78	0.276	
MW268	9/06/2022	3.624	0.432	
MW268	6/09/2022	3.66	0.396	
MW268	13/12/22	4.035	0.021	
MW268	15/03/2023	3.895	0.161	
MW268	6/06/2023	3.5	0.556	
MW268	4/09/2023	3.845	0.211	
MW269	1/08/2017	3.99	0.163	sampled at 4.99
MW269	19/09/2017	4.011	0.142	
MW269	16/10/2017	3.885	0.268	
MW269	17/11/2017	3.955	0.198	
MW269	7/12/2017	4.16	-0.007	NO ODOUR, V SL TANNIN APPEARANCE
MW269	16/01/2018	3.954	0.199	NO ODOUR, V SL TANNIN APPEARANCE
MW269	12/11/2019	4.16	-0.007	
MW269	19/12/2019	4	0.153	
MW269	30/03/2020	3.97	0.183	
MW269	21/07/2020	3.85	0.303	
MW269	21/09/2020	4.075	0.078	
MW269	21/09/2020	4.075	0.078	
MW269	14/12/2020	3.98	0.173	
MW269	16/03/2021	3.84	0.313	
MW269	9/06/2021	3.738	0.415	
MW269	31/08/2021	4.02	0.133	
MW269	11/11/2021	4.02	0.133	
MW269	16/11/2021	4.02	0.133	
MW269	11/01/2022	3.985	0.168	
MW269	17/03/2022	3.89	0.263	
MW269	9/06/2022	3.657	0.496	
MW269	6/09/2022	3.75	0.403	
MW269	13/12/22	4.14	0.013	
MW269	15/03/2023	4.01	0.143	
MW269	6/06/2023	3.58	0.573	
MW269	4/09/2023	3.97	0.183	
MW282	11/09/2017	5.345	0.435	
MW282	16/10/2017	5.4	0.38	
MW282	17/11/2017	5.41	0.37	
MW282	5/12/2017	5.422	0.358	NO O/S
MW282	15/01/2018	5.47	0.31	NO O/S
MW282	18/12/2019	5.5	0.28	

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW282	31/03/2020	5.412	0.368	
MW282	22/07/2020	5.21	0.57	
MW282	24/09/2020	5.378	0.402	
MW282	24/09/2020	5.378	0.402	
MW282	15/12/2020	5.4	0.38	
MW282	18/03/2021	7.5	-1.72	erroneous SWL reading
MW282	9/06/2021	5.25	0.53	
MW282	31/08/2021	5.24	0.54	
MW282	16/11/2021	5.24	0.54	
MW282	13/01/2022	5.355	0.425	Very orange slight organic odour
MW282	17/03/2022	5.33	0.45	
MW282	8/06/2022	5.65	0.13	
MW282	8/09/2022	5.25	0.53	
MW282	13/12/22	5.37	0.41	
MW282	15/03/2023	5.4	0.38	
MW282	8/06/2023	5.2	0.58	
MW282	14/07/2023	5.295	0.485	flush mount with HS broken off at base, blocking bottom by 0.50 m
MW282	4/09/2023	5.36	0.42	
MW288	18/09/2017	3.863	0.14	
MW288	17/10/2017	3.665	0.338	
MW288	15/11/2017	3.94	0.063	no o/s
MW288	7/12/2017	4.005	-0.002	NO ODOUR, SL TANNIN APPEARANCE
MW288	15/01/2018	3.915	0.088	
MW288	8/01/2020	5.25	-1.247	Dry
MW288	1/04/2020	3.68	0.323	Less than 5cm of water, could not sample
MW288	15/07/2020	3.55	0.453	
MW288	22/09/2020			Dry
MW288	22/09/2020			Dry
MW288	15/12/2020			Dry
MW288	17/03/2021	3.585	0.418	
MW288	10/06/2021			Dry
MW288	31/08/2021	3.692	0.311	
MW288	12/01/2022	3.81	0.193	
MW288	8/06/2022	3.65	0.353	
MW288	6/09/2022	3.49	0.513	
MW288	12/12/22	3.76	0.243	
MW288	14/03/2023	3.84	0.163	
MW288	7/06/2023	3.52	0.483	
MW288	5/09/2023	3.79	0.213	
MW289	18/09/2017	4.119	0.376	
MW289	17/10/2017	4.11	0.385	
MW289	15/11/2017	4.21	0.285	no o/s
MW289	7/12/2017	4.195	0.3	NO O/S
MW289	15/01/2018	4.265	0.23	NO O/S
MW289	17/01/2020			Not found
MW289	30/03/2020	4.186	0.309	
MW289	22/07/2020	3.97	0.525	
MW289	21/09/2020	4.105	0.39	
MW289	21/09/2020	4.105	0.39	
MW289	15/12/2020	4.28	0.215	
MW289	16/03/2021	4.1	0.395	
MW289	9/06/2021	3.94	0.555	
MW289	30/08/2021	3.853	0.642	
MW289	17/03/2022	4.08	0.415	
MW289	8/06/2022	3.964	0.531	
MW289	5/09/2022	3.8	0.695	
MW289	13/12/22	4.145	0.35	
MW289	14/03/2023	4.2	0.295	
MW289	6/06/2023	3.858	0.637	
MW289	4/09/2023	4.045	0.45	
MW496	14/10/2019	4.985	0.107	
MW496	6/09/2022	4.639	0.453	Sampled instead of nearby damaged wells
MW496	14/11/2022	4.837	0.255	
MW496	13/12/22	4.93	0.162	
MW496	13/03/2023	4.96	0.132	
MW496	11/05/2023	4.741	0.351	Monument, Good condition, Steel stick up.
MW496	6/06/2023	4.96	0.132	
MW496	4/09/2023	4.8	0.292	
MW500	5/11/2019	3.512	0.18	
MW500	15/11/2021	3.312	0.38	
MW500	10/01/2022	3.38	0.312	Bore lid Labelled MW500, MW117 not found
MW500	14/03/2022	3.233	0.459	
MW500	7/06/2022	3.243	0.449	
MW500	5/09/2022	3.25	0.442	
MW500	12/12/22	3.45	0.242	
MW500	13/03/2023	3.33	0.362	
MW500	6/06/2023	3.075	0.617	
MW500	5/09/2023	3.305	0.387	

Table 9 - Groundwater Gauging data

Location Code	Date	Water Depth (mbTOC)	Elevation (mAH	Comments
MW516	30/03/2020	6.179	0.191	
MW516	21/07/2020	6.03	0.34	
MW516	21/09/2020	6.12	0.25	
MW516	21/09/2020	6.12	0.25	
MW516	30/09/2020	6.097	0.273	
MW516	7/10/2020	6.223	0.147	
MW516	16/12/2020	6.155	0.215	
MW516	16/02/2021	6.16	0.21	
MW516	17/02/2021	6.154	0.216	
MW516	18/03/2021	6.29	0.08	
MW516	9/06/2021	6.002	0.368	
MW516	31/08/2021	5.175	1.195	
MW516	16/11/2021	5.175	1.195	
MW516	12/01/2022	6.139	0.231	Clear slight fuel odour
MW516	17/03/2022	6.08	0.29	
MW516	8/06/2022	5.985	0.385	
MW516	6/09/2022	5.87	0.5	
MW516	13/12/22	6.17	0.2	
MW516	13/03/2023	6.15	0.22	
MW516	6/06/2023	5.93	0.44	
MW516	4/09/2023	6.055	0.315	

Trend Report

Report Date & Time: 2024-04-21 06:58:39

Data File Name: 0089_MKA_PFOS+PFHxS_input.csv

Report Title: Groundwater Trend PFOS+PFHxS

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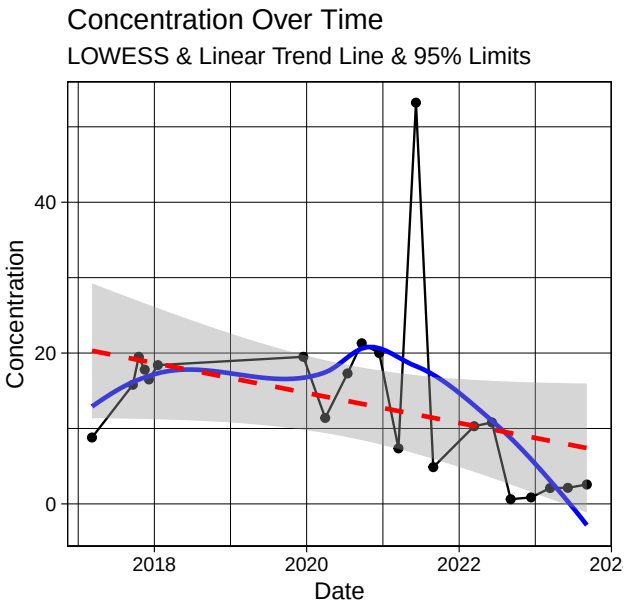
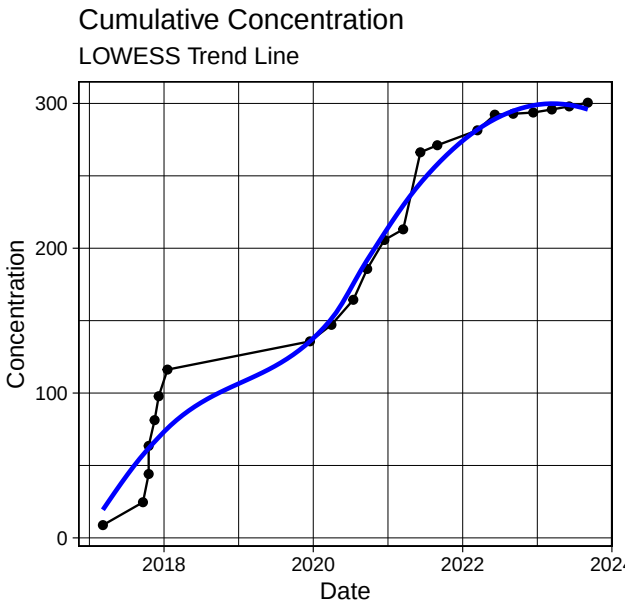
Kendall Trend Test Results Continuous	
n	22
z	-2.28
p	0.02
S	-82
varS	1256.67
tau	-0.36
mean	13.66
sd	11.38
cov	0.83
results	DECREASING

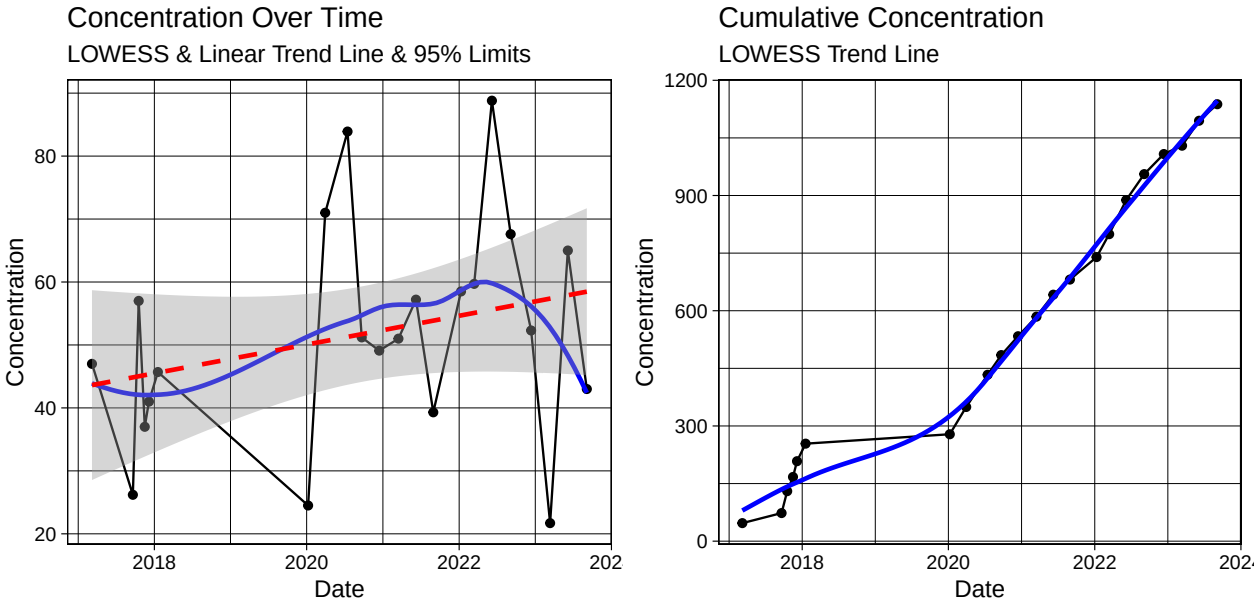
Report for ID : MW109 and Analyte : PFHxS + PFOS





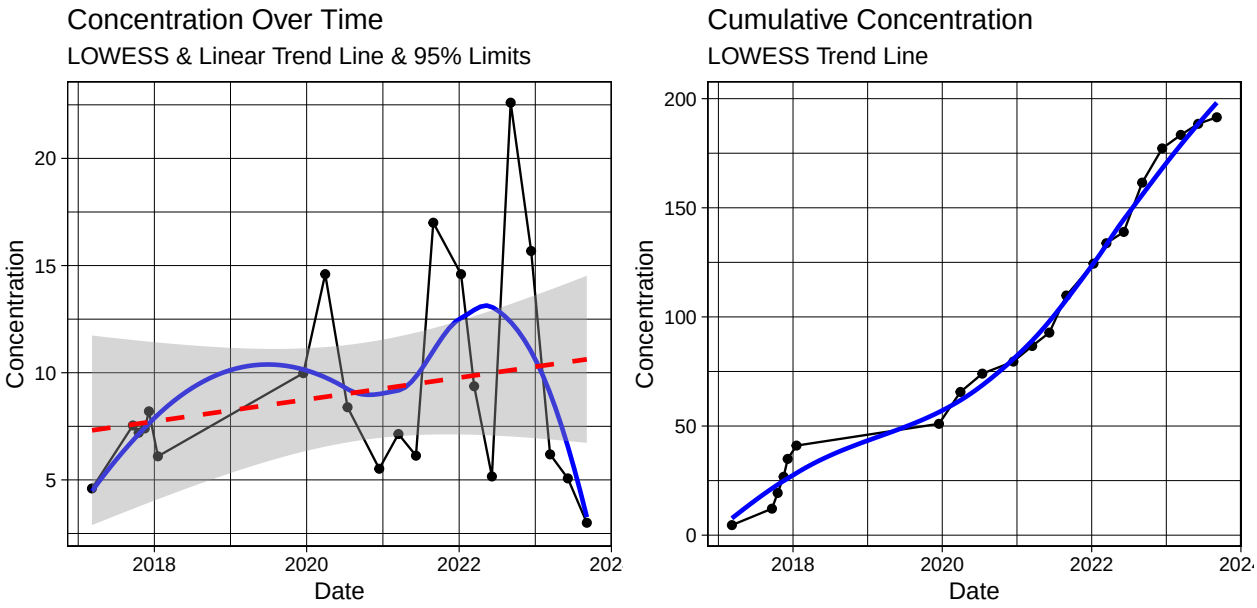
Kendall Trend Test Results Continuous	
n	22
z	1.47
p	0.14
S	53
varS	1257.67
tau	0.23
mean	51.71
sd	17.32
cov	0.33
results	NO CLEAR TREND

Report for ID : MW112 and Analyte : PFHxS + PFOS



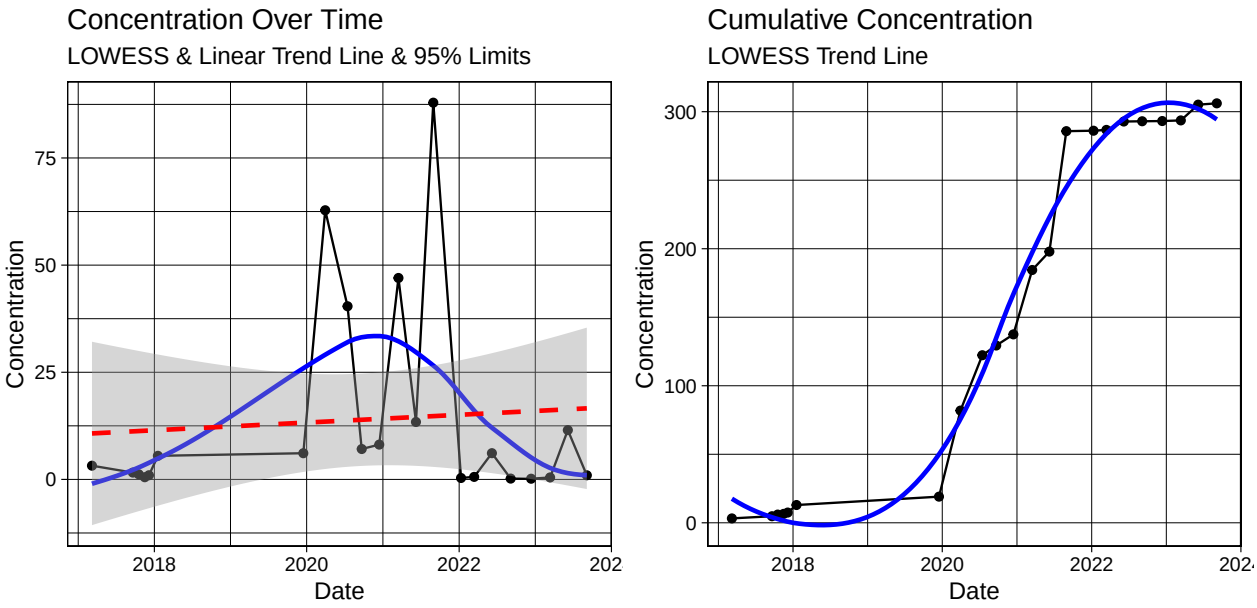
Kendall Trend Test Results Continuous	
n	21
z	0.06
p	0.95
S	3
varS	1095.67
tau	0.01
mean	9.12
sd	4.96
cov	0.54
results	NO CLEAR TREND

Report for ID : MW120 and Analyte : PFHxS + PFOS



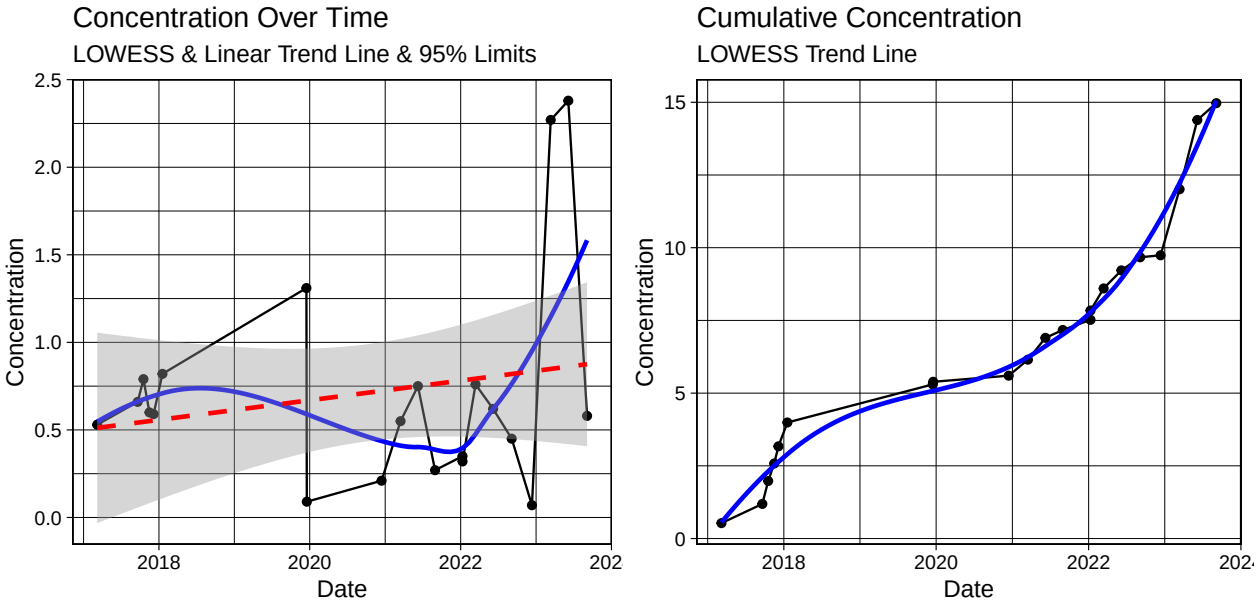
Kendall Trend Test Results Continuous	
n	22
z	-0.39
p	0.69
S	-15
varS	1257.67
tau	-0.06
mean	13.91
sd	23.71
cov	1.7
results	NO CLEAR TREND

Report for ID : MW121 and Analyte : PFHxS + PFOS



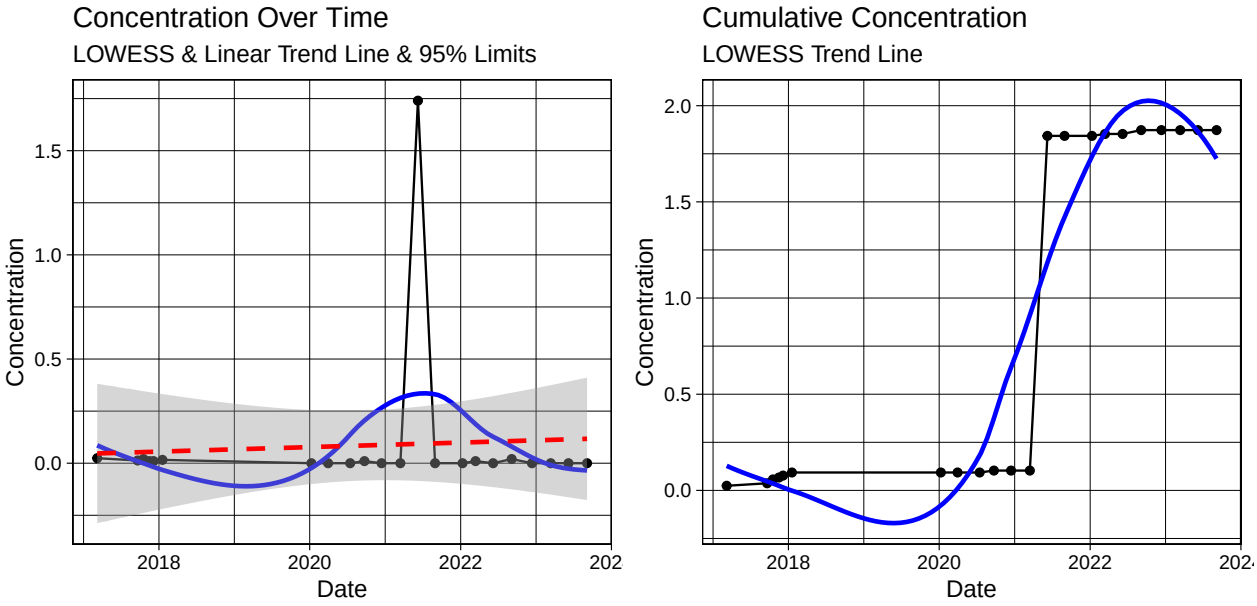
Kendall Trend Test Results Continuous	
n	21
z	0.03
p	0.98
S	2
varS	1096.67
tau	0.01
mean	0.71
sd	0.6
cov	0.85
results	NO CLEAR TREND

Report for ID : MW123 and Analyte : PFHxS + PFOS



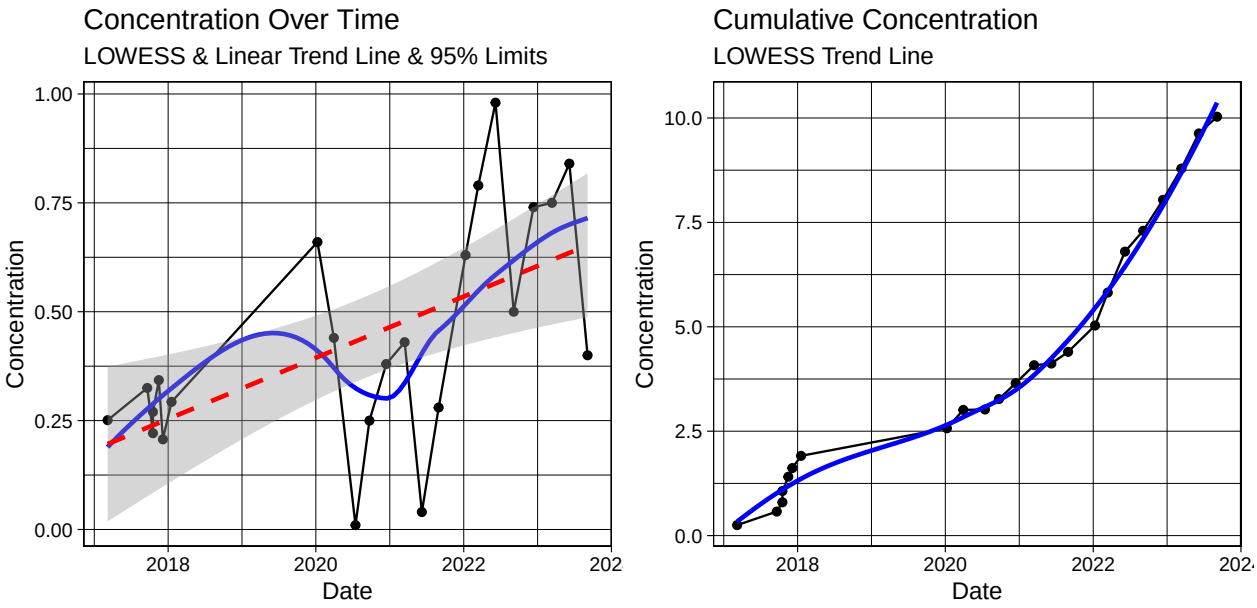
Kendall Trend Test Results Continuous	
n	22
z	-2.39
p	0.02
S	-78
varS	1035.33
tau	-0.41
mean	0.09
sd	0.37
cov	4.34
results	DECREASING

Report for ID : MW124 and Analyte : PFHxS + PFOS



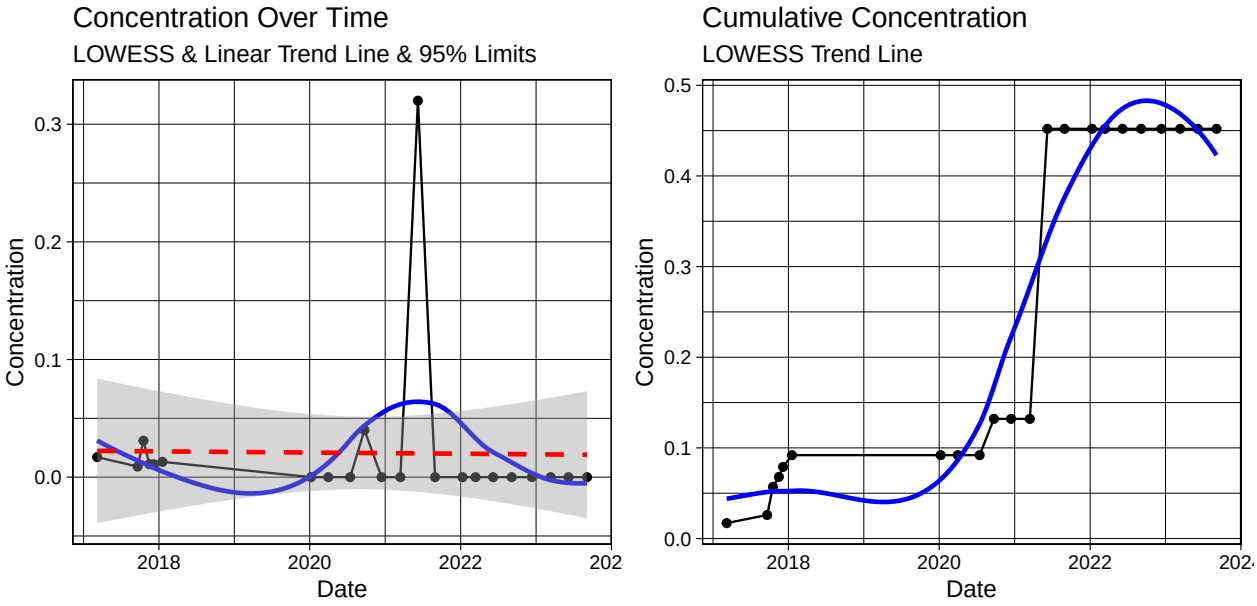
Kendall Trend Test Results Continuous	
n	23
z	2.96
p	0
S	113
varS	1433.67
tau	0.45
mean	0.44
sd	0.26
cov	0.59
results	INCREASING

Report for ID : MW125 and Analyte : PFHxS + PFOS



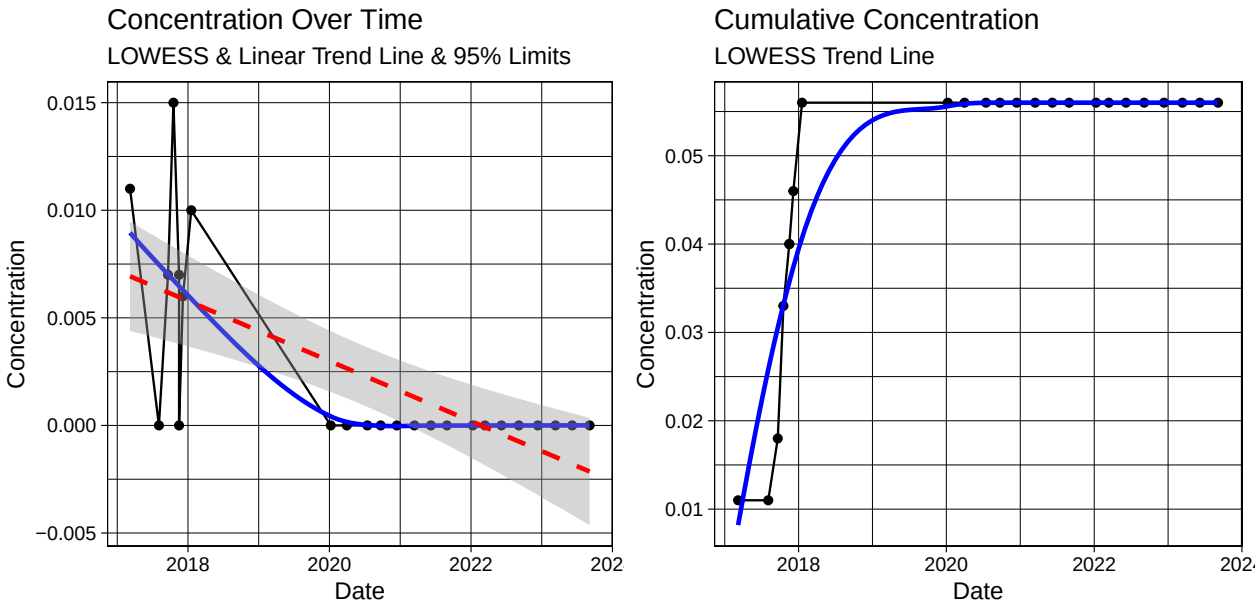
Kendall Trend Test Results Continuous	
n	22
z	-2.7
p	0.01
S	-83
varS	923
tau	-0.46
mean	0.02
sd	0.07
cov	3.3
results	DECREASING

Report for ID : MW126 and Analyte : PFHxS + PFOS



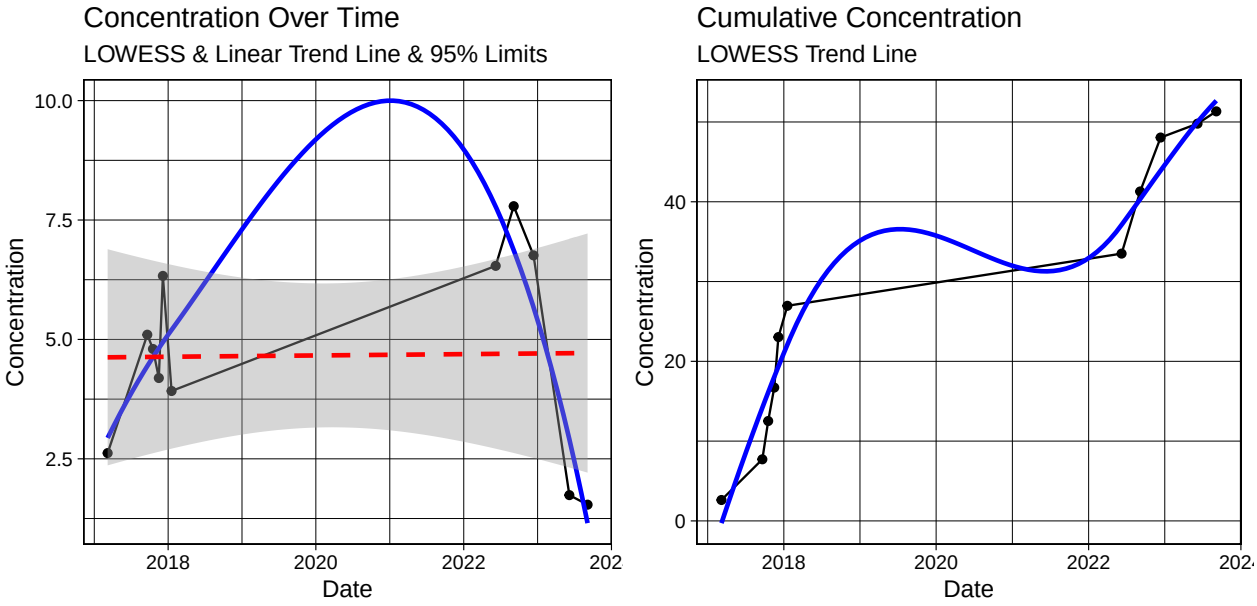
Kendall Trend Test Results Continuous	
n	24
z	-3.19
p	0
S	-98
varS	927.33
tau	-0.53
mean	0
sd	0
cov	1.89
results	DECREASING

Report for ID : MW127 and Analyte : PFHxS + PFOS



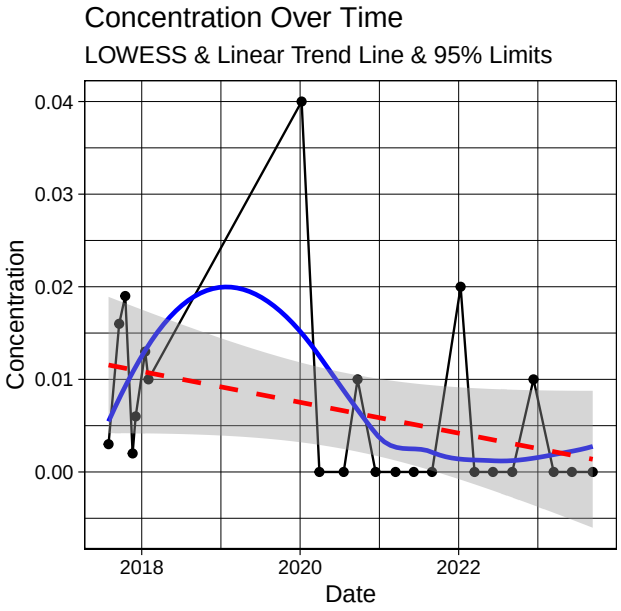
Kendall Trend Test Results Continuous	
n	11
z	0
p	1
S	1
varS	165
tau	0.02
mean	4.67
sd	2.1
cov	0.45
results	NO CLEAR TREND

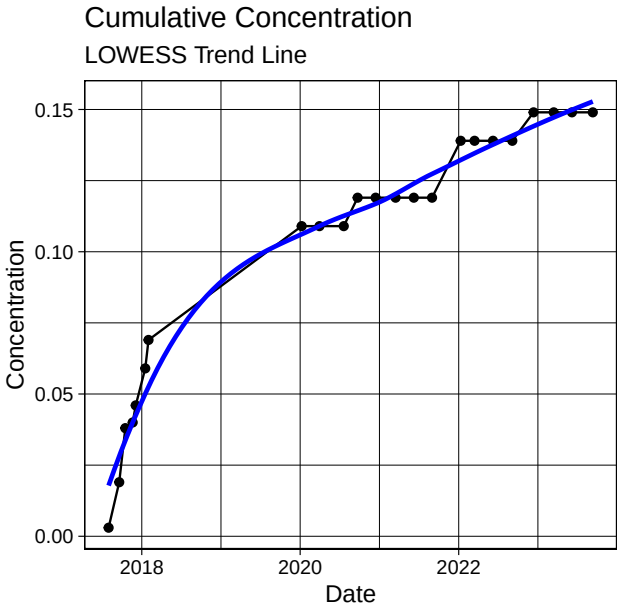
Report for ID : MW128 and Analyte : PFHxS + PFOS



Kendall Trend Test Results Continuous	
n	23
z	-2.44
p	0.01
S	-86
varS	1217.33
tau	-0.4
mean	0.01
sd	0.01
cov	1.53
results	DECREASING

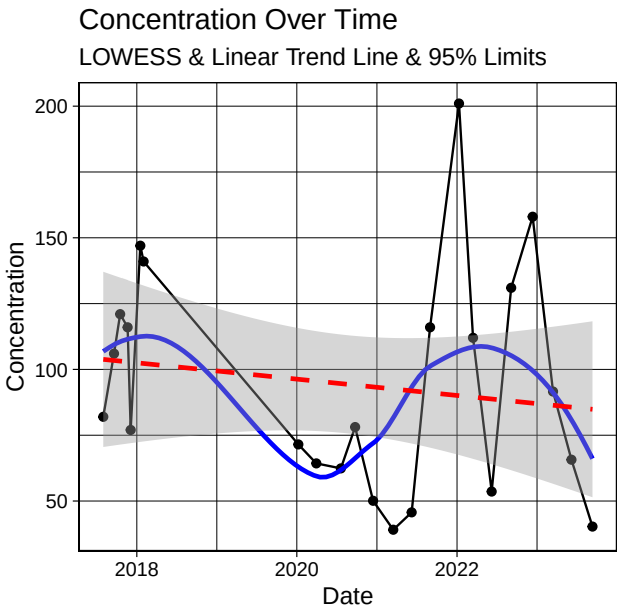
Report for ID : MW139 and Analyte : PFHxS + PFOS

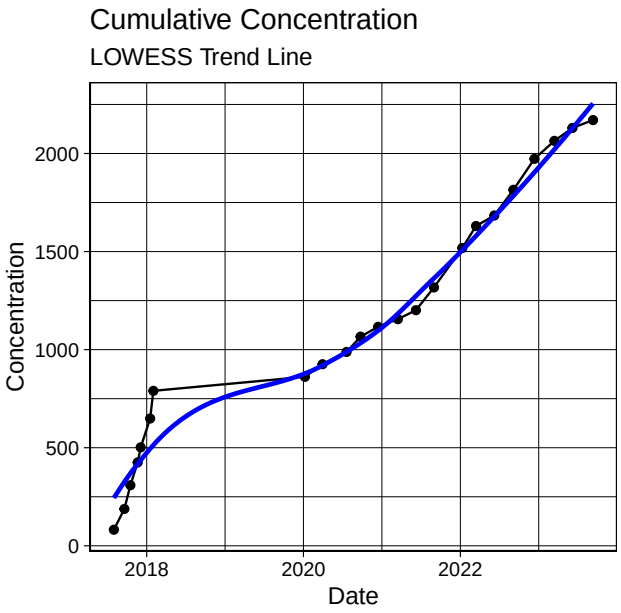




Kendall Trend Test Results Continuous	
n	23
z	-0.92
p	0.36
S	-36
varS	1432.67
tau	-0.14
mean	94.37
sd	42.51
cov	0.45
results	STABLE

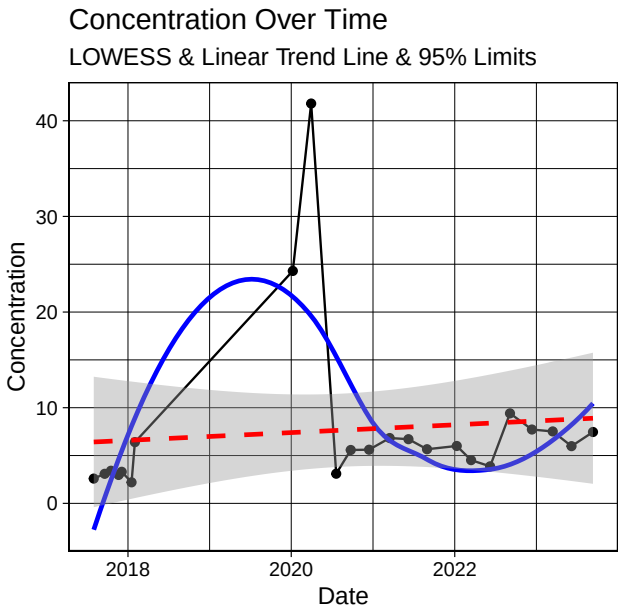
Report for ID : MW141 and Analyte : PFHxS + PFOS

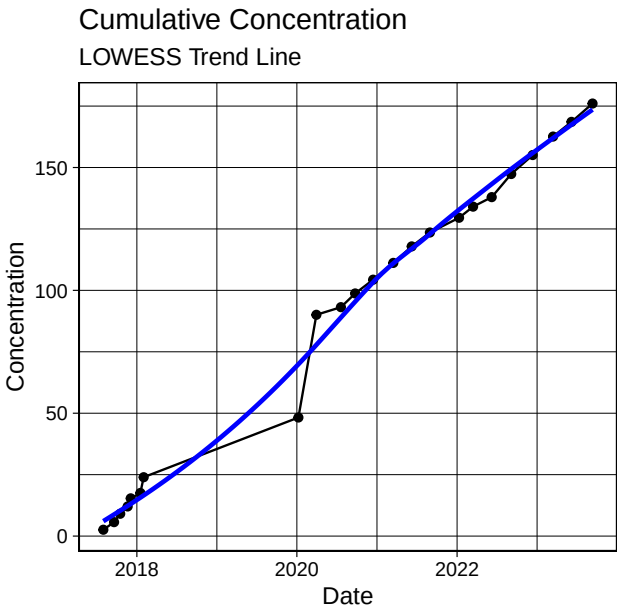




Kendall Trend Test Results Continuous	
n	23
z	2.64
p	0.01
S	101
varS	1433.67
tau	0.4
mean	7.65
sd	8.65
cov	1.13
results	INCREASING

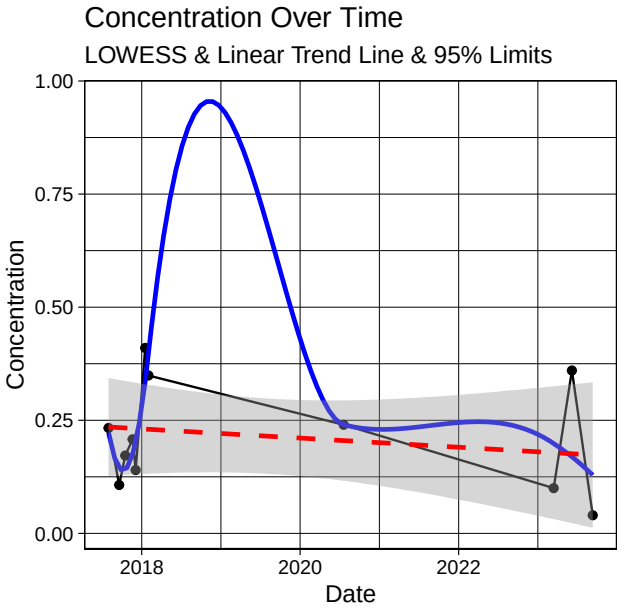
Report for ID : MW142 and Analyte : PFHxS + PFOS

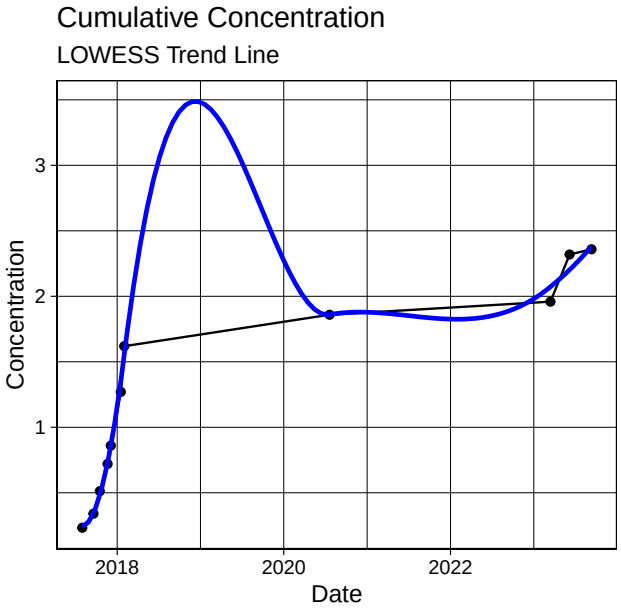




Kendall Trend Test Results Continuous	
n	11
z	0
p	1
S	-1
varS	165
tau	-0.02
mean	0.21
sd	0.12
cov	0.55
results	STABLE

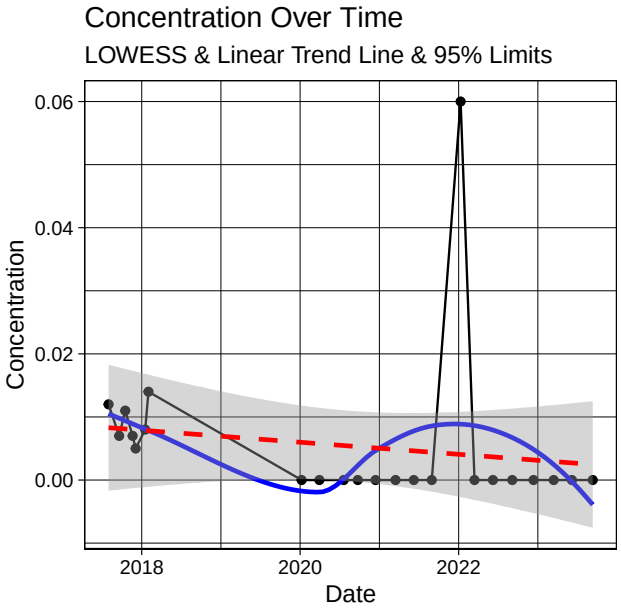
Report for ID : MW147 and Analyte : PFHxS + PFOS

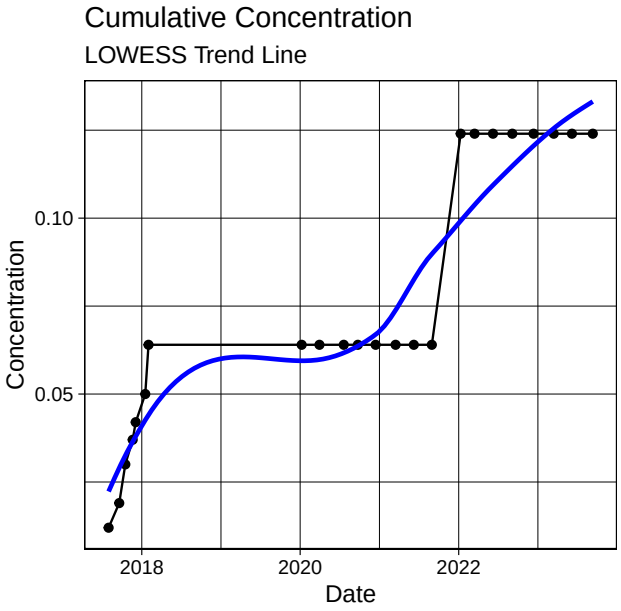




Kendall Trend Test Results Continuous	
n	23
z	-3
p	0
S	-97
varS	1024.33
tau	-0.5
mean	0.01
sd	0.01
cov	2.37
results	DECREASING

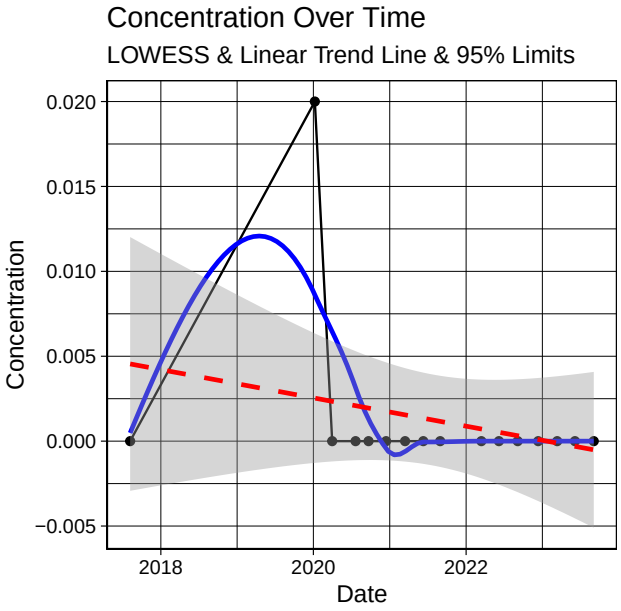
Report for ID : MW149 and Analyte : PFHxS + PFOS

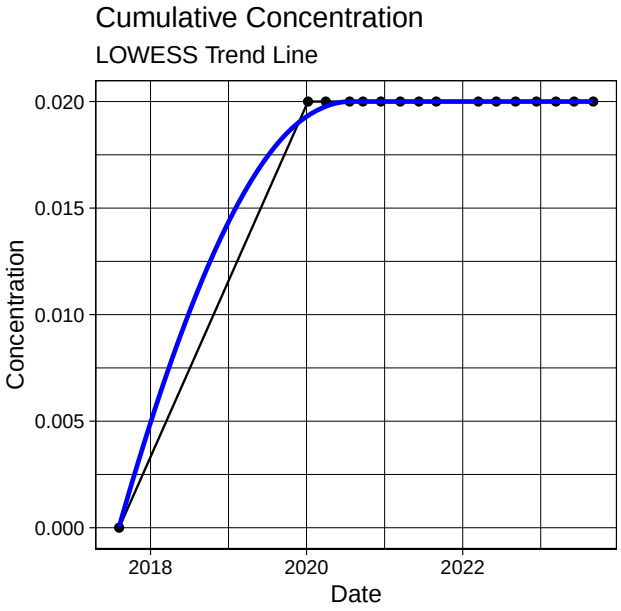




Kendall Trend Test Results Continuous	
n	16
z	-1.3
p	0.19
S	-13
varS	85
tau	-0.31
mean	0
sd	0
cov	4
results	NO CLEAR TREND

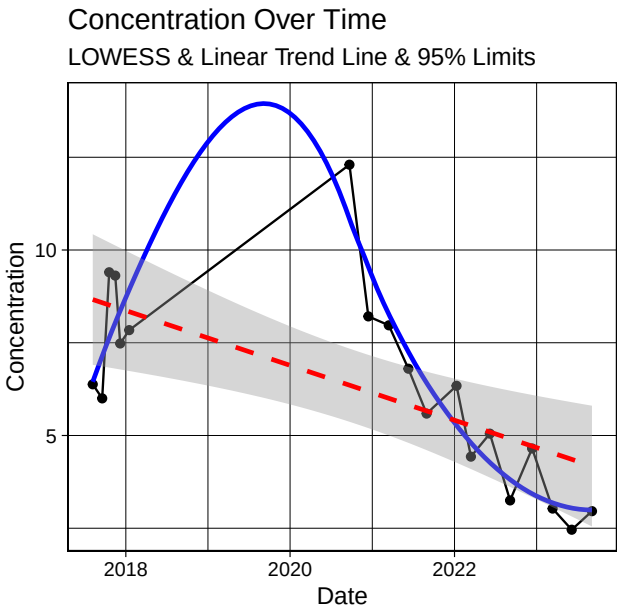
Report for ID : MW158 and Analyte : PFHxS + PFOS

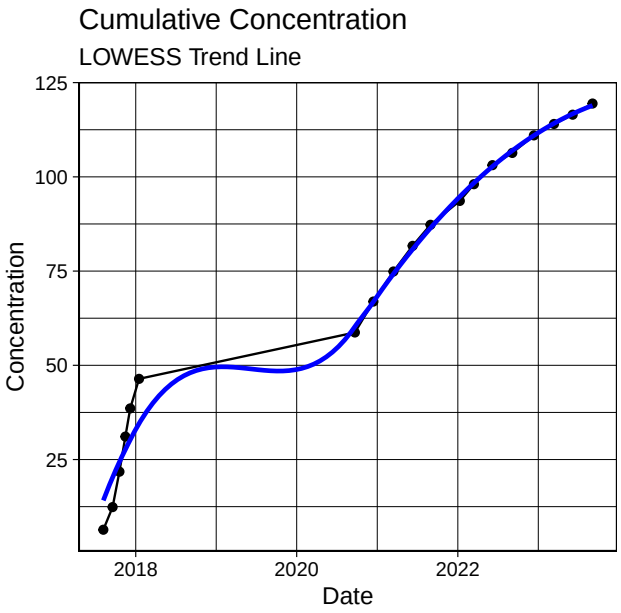




Kendall Trend Test Results Continuous	
n	19
z	-3.78
p	0
S	-109
varS	817
tau	-0.64
mean	6.29
sd	2.58
cov	0.41
results	DECREASING

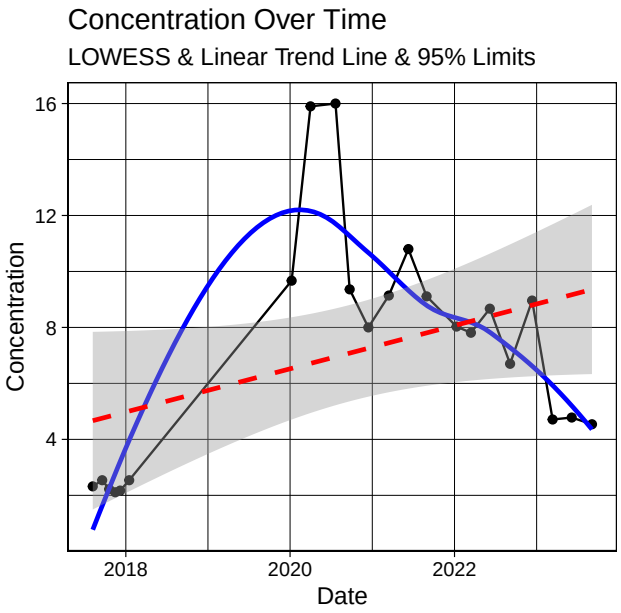
Report for ID : MW161 and Analyte : PFHxS + PFOS

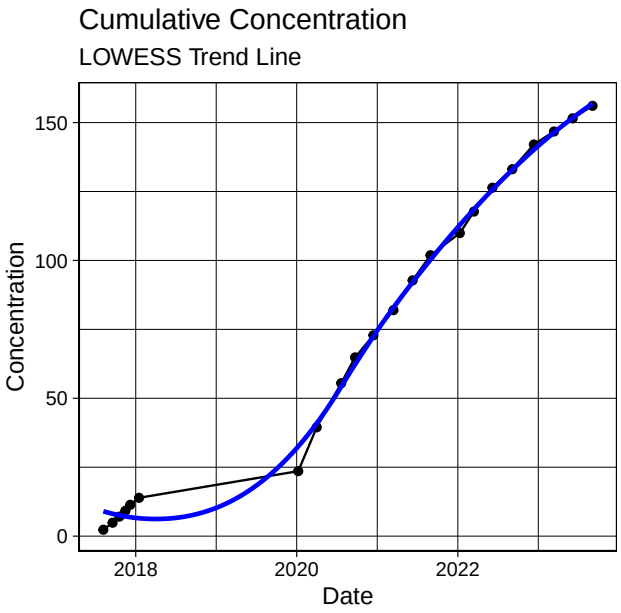




Kendall Trend Test Results Continuous	
n	22
z	0.31
p	0.76
S	12
varS	1256.67
tau	0.05
mean	7.09
sd	4.1
cov	0.58
results	NO CLEAR TREND

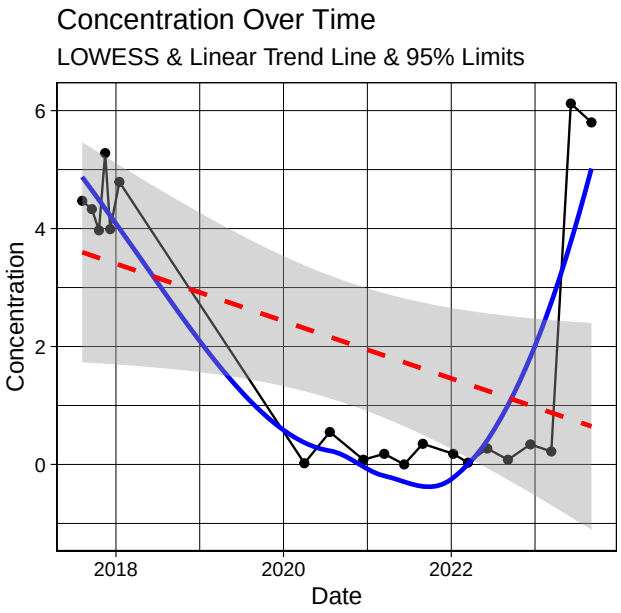
Report for ID : MW166 and Analyte : PFHxS + PFOS

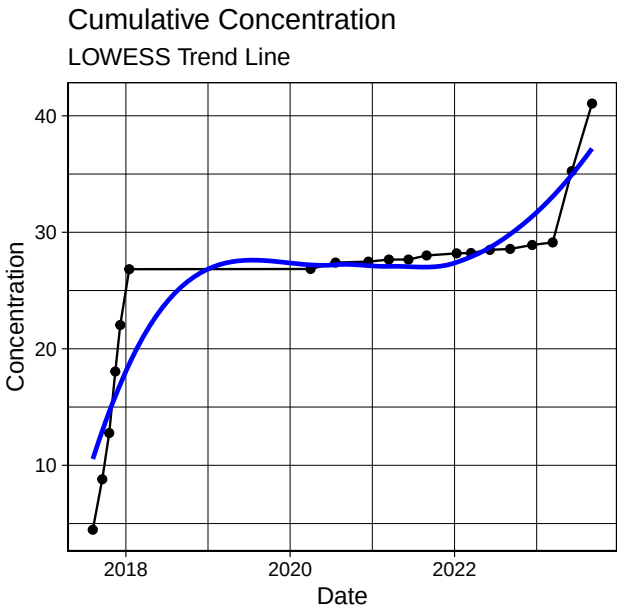




Kendall Trend Test Results Continuous	
n	20
z	-0.81
p	0.42
S	-26
varS	948
tau	-0.14
mean	2.05
sd	2.39
cov	1.17
results	NO CLEAR TREND

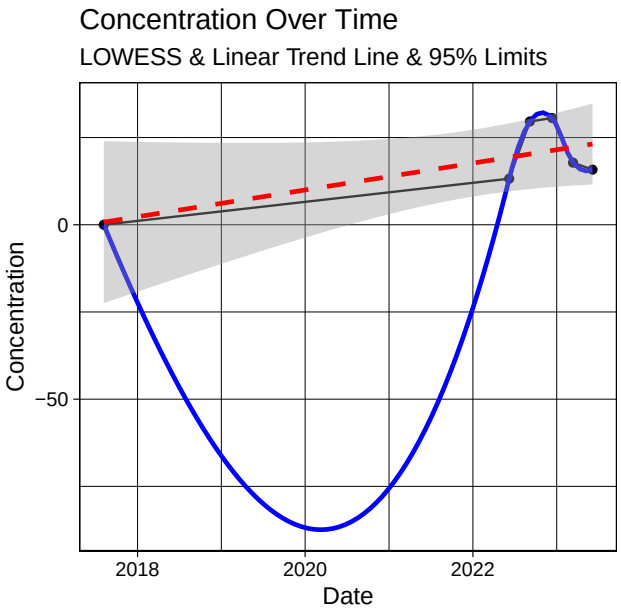
Report for ID : MW171 and Analyte : PFHxS + PFOS

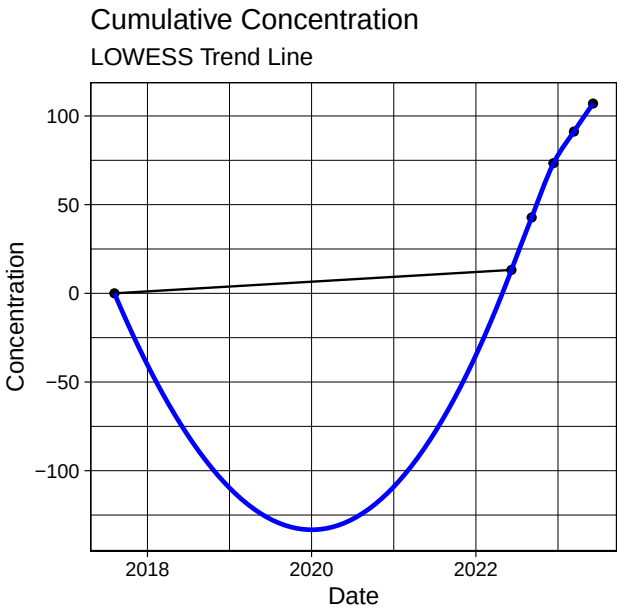




Kendall Trend Test Results Continuous	
n	6
z	0.75
p	0.45
S	5
varS	28.33
tau	0.33
mean	17.83
sd	11.36
cov	0.64
results	NO CLEAR TREND

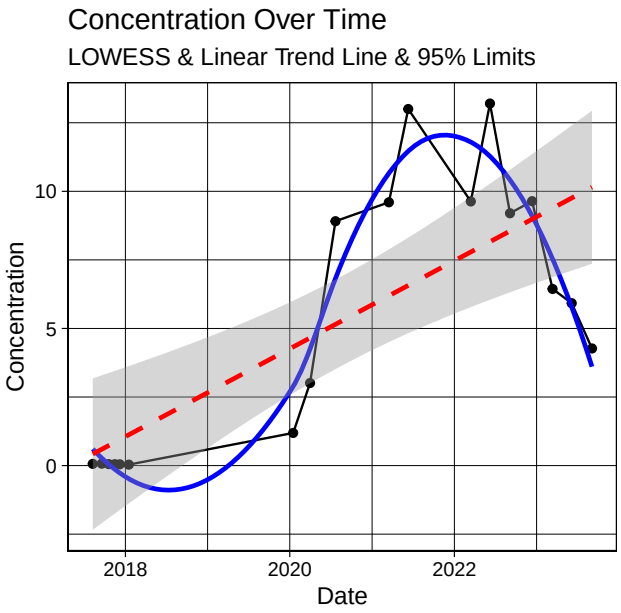
Report for ID : MW172 and Analyte : PFHxS + PFOS

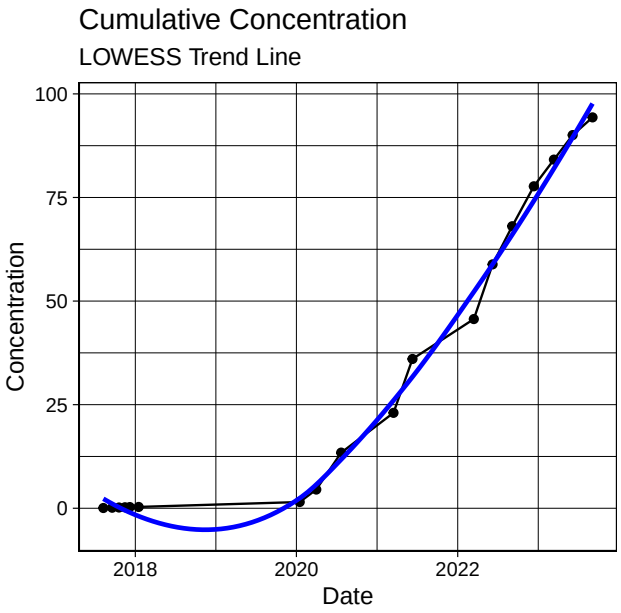




Kendall Trend Test Results Continuous	
n	18
z	2.35
p	0.02
S	63
varS	697
tau	0.41
mean	5.24
sd	4.83
cov	0.92
results	INCREASING

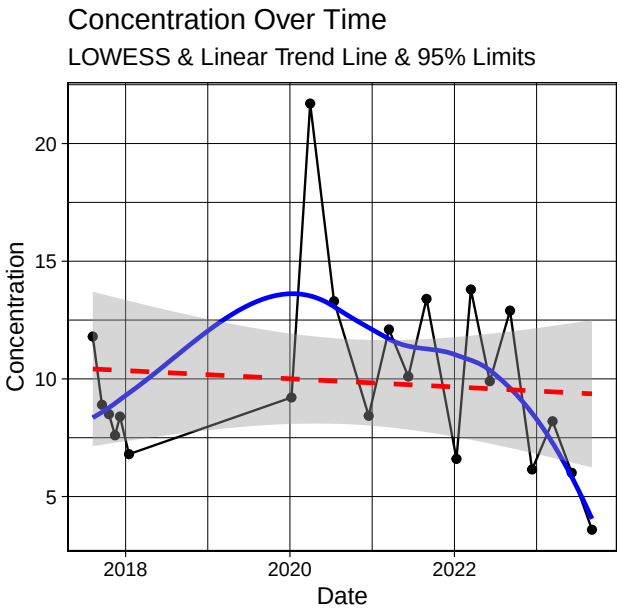
Report for ID : MW173 and Analyte : PFHxS + PFOS

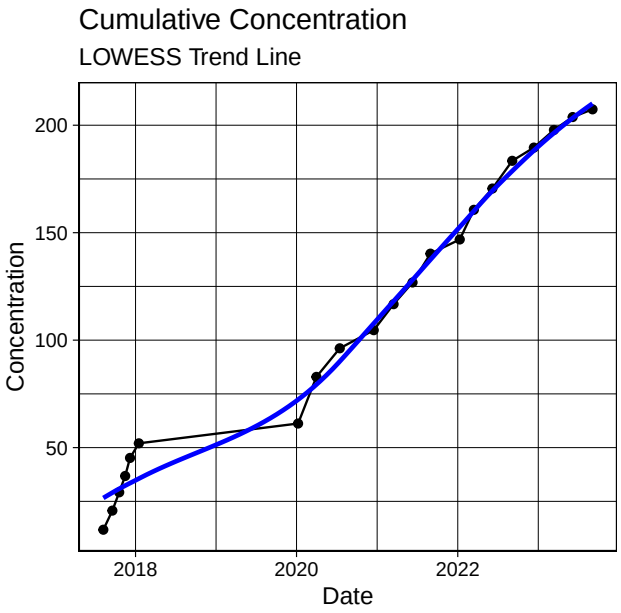




Kendall Trend Test Results Continuous	
n	21
z	-1.12
p	0.26
S	-38
varS	1096.67
tau	-0.18
mean	9.88
sd	3.88
cov	0.39
results	STABLE

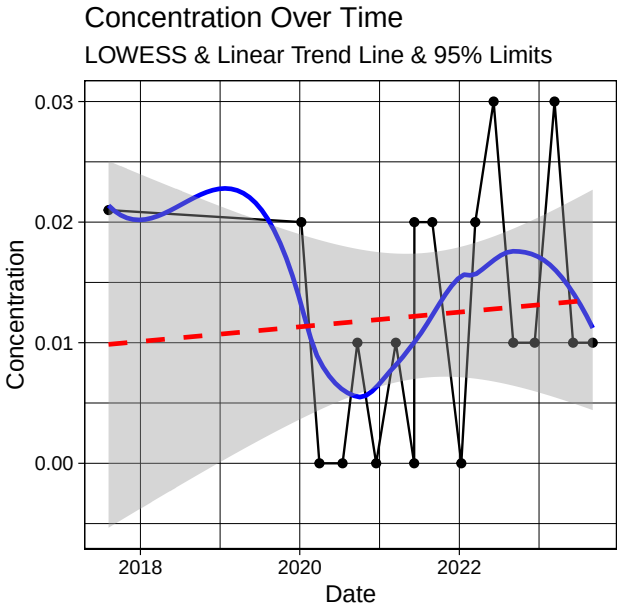
Report for ID : MW193 and Analyte : PFHxS + PFOS

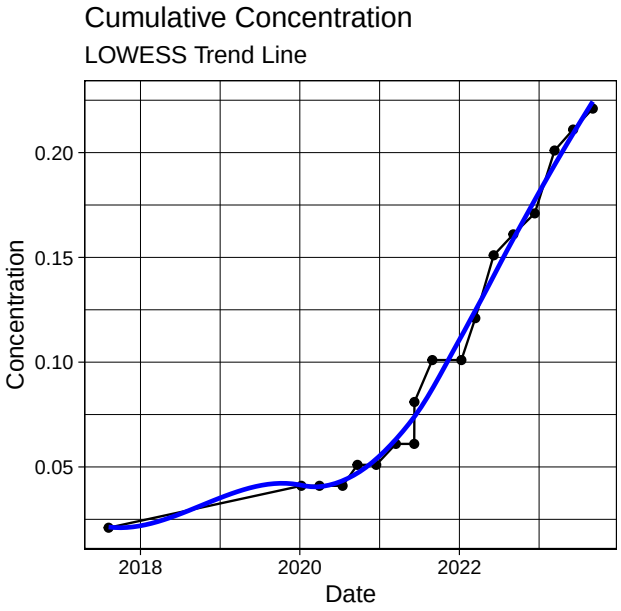




Kendall Trend Test Results Continuous	
n	18
z	0.71
p	0.48
S	19
varS	642.33
tau	0.14
mean	0.01
sd	0.01
cov	0.82
results	NO CLEAR TREND

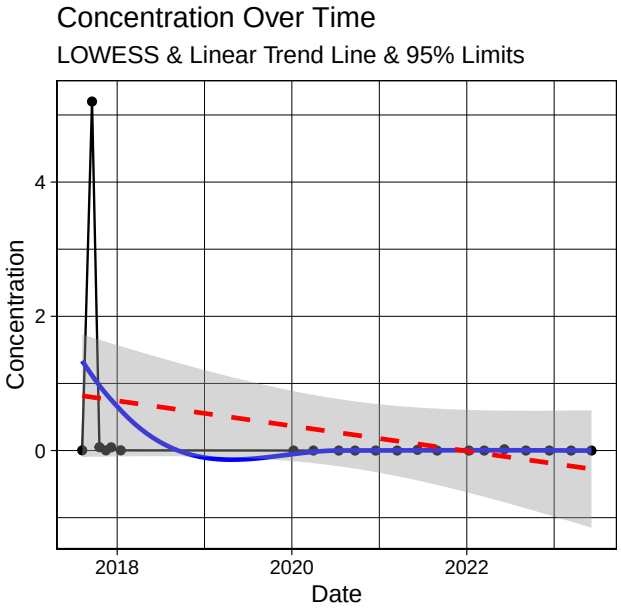
Report for ID : MW195D and Analyte : PFHxS + PFOS

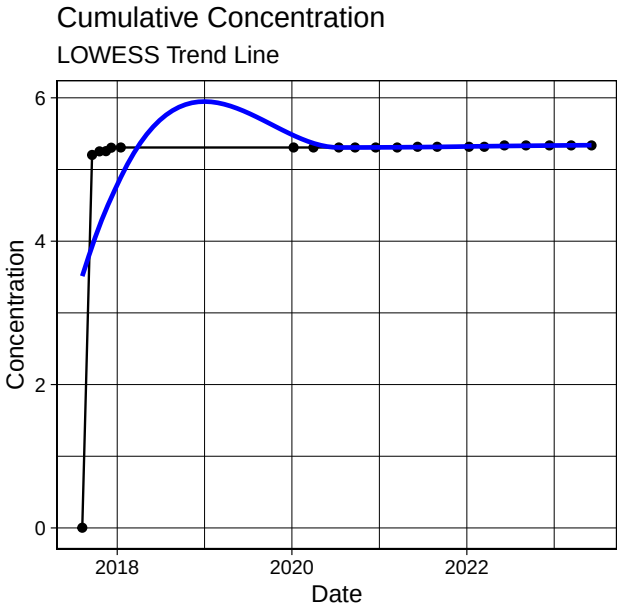




Kendall Trend Test Results Continuous	
n	21
z	-2.65
p	0.01
S	-77
varS	824.33
tau	-0.47
mean	0.25
sd	1.13
cov	4.46
results	DECREASING

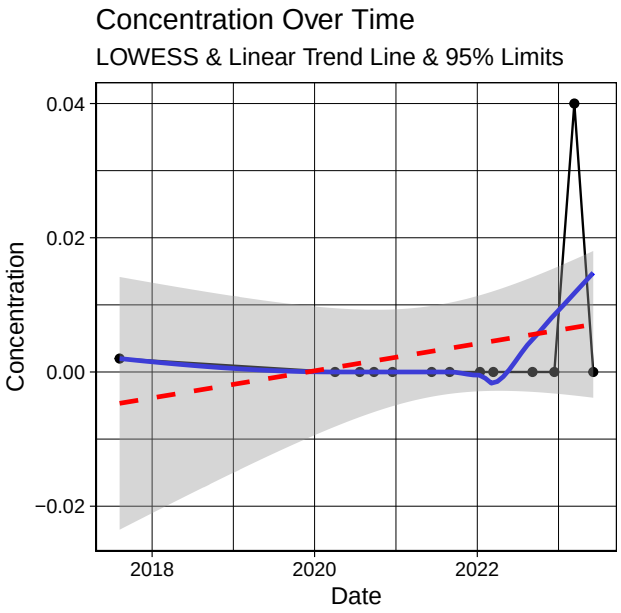
Report for ID : MW195S and Analyte : PFHxS + PFOS

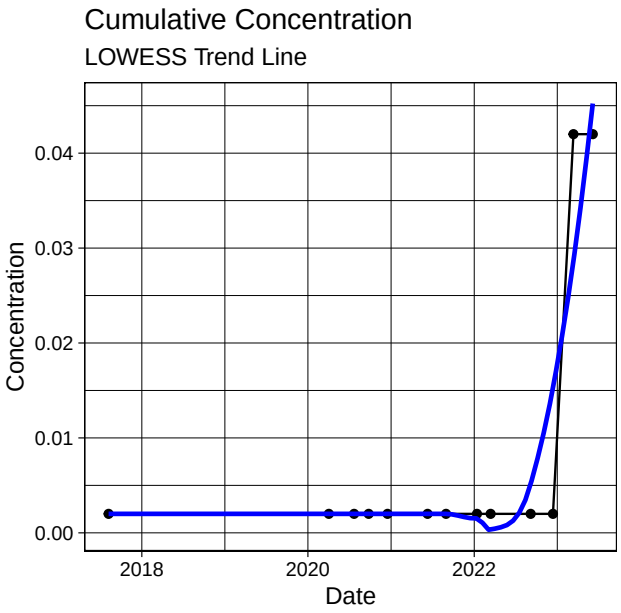




Kendall Trend Test Results Continuous	
n	13
z	0
p	1
S	-1
varS	103.67
tau	-0.02
mean	0
sd	0.01
cov	3.42
results	NO CLEAR TREND

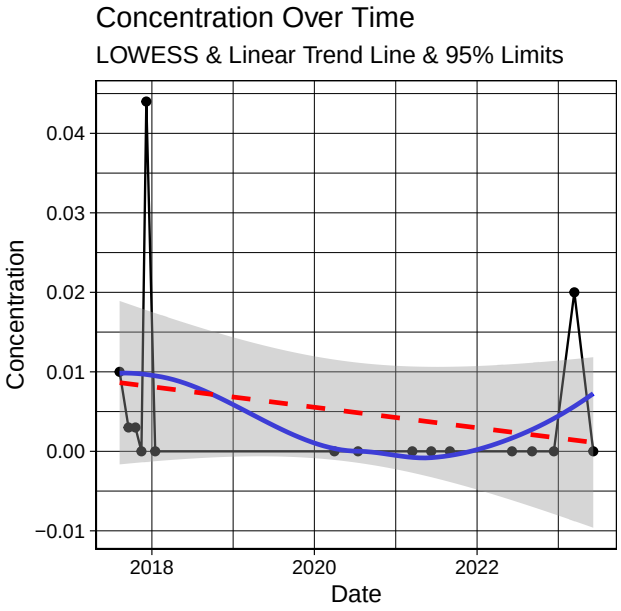
Report for ID : MW196 and Analyte : PFHxS + PFOS

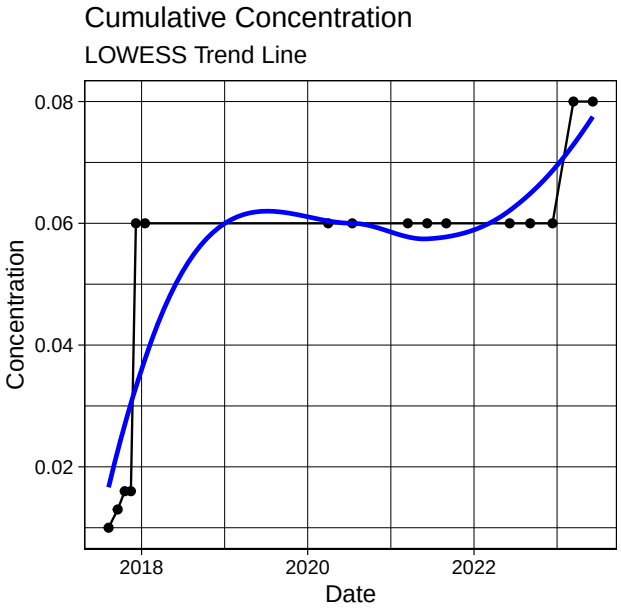




Kendall Trend Test Results Continuous	
n	16
z	-1.6
p	0.11
S	-30
varS	327.33
tau	-0.34
mean	0
sd	0.01
cov	2.34
results	NO CLEAR TREND

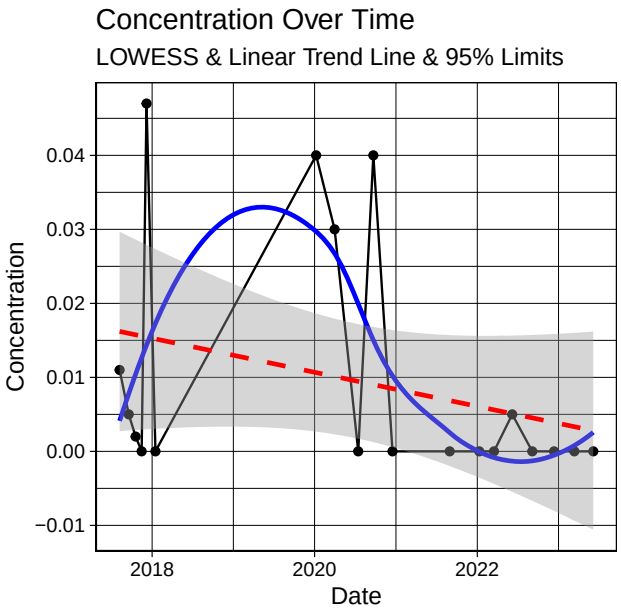
Report for ID : MW197 and Analyte : PFHxS + PFOS

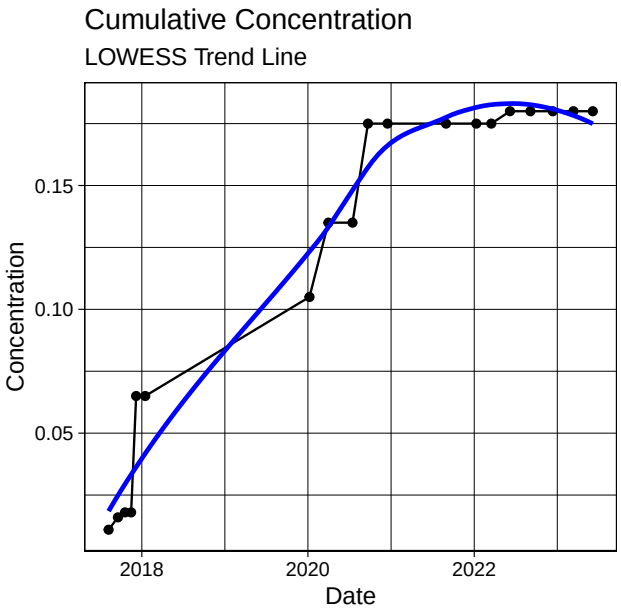




Kendall Trend Test Results Continuous	
n	19
z	-2.16
p	0.03
S	-56
varS	650
tau	-0.4
mean	0.01
sd	0.02
cov	1.72
results	DECREASING

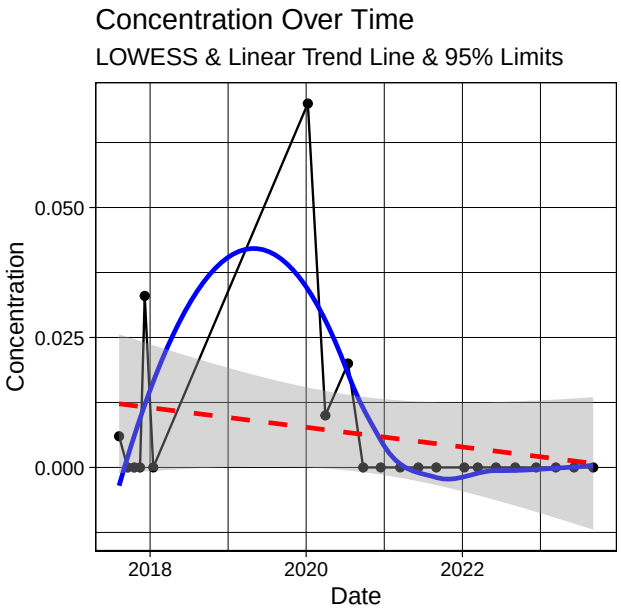
Report for ID : MW199 and Analyte : PFHxS + PFOS

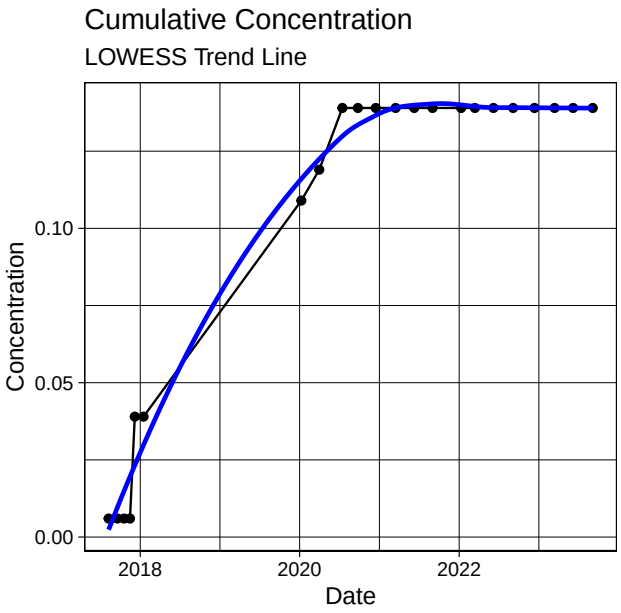




Kendall Trend Test Results Continuous	
n	22
z	-2.01
p	0.04
S	-53
varS	668.33
tau	-0.36
mean	0.01
sd	0.02
cov	2.6
results	DECREASING

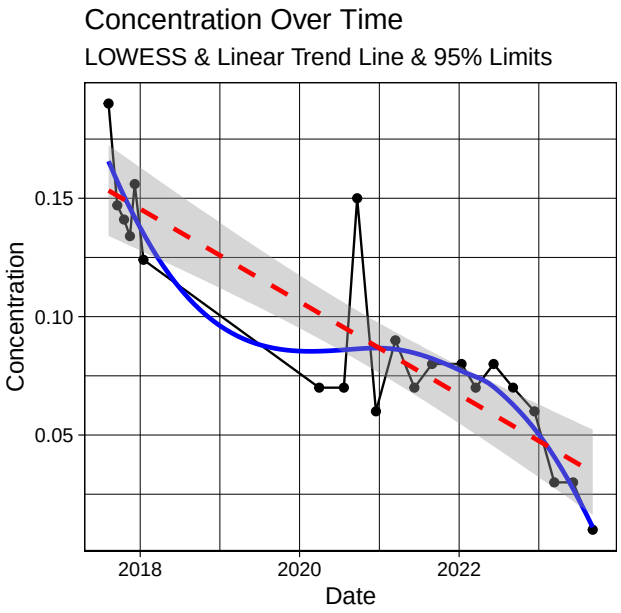
Report for ID : MW200 and Analyte : PFHxS + PFOS

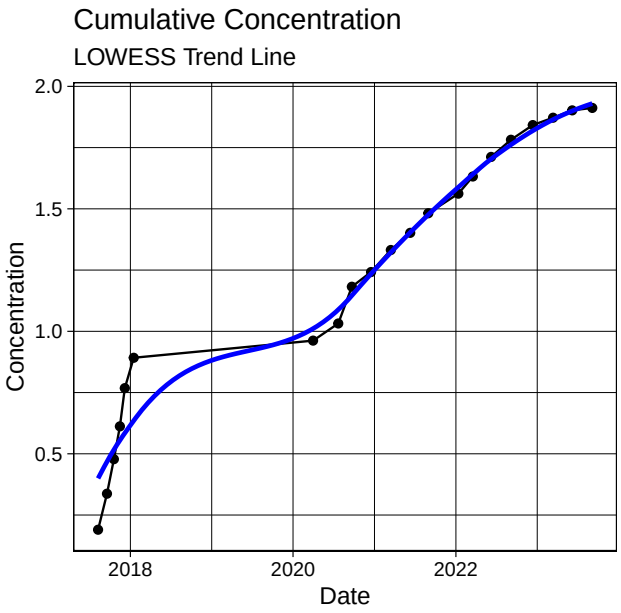




Kendall Trend Test Results Continuous	
n	21
z	-4.21
p	0
S	-139
varS	1074.33
tau	-0.69
mean	0.09
sd	0.05
cov	0.52
results	DECREASING

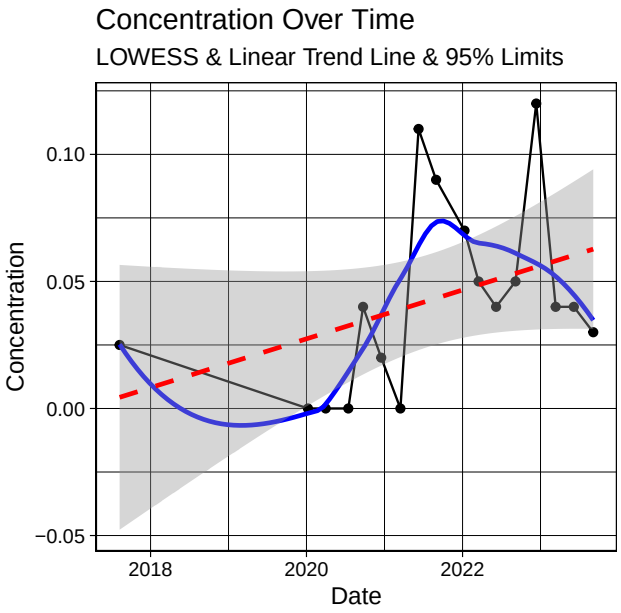
Report for ID : MW202 and Analyte : PFHxS + PFOS

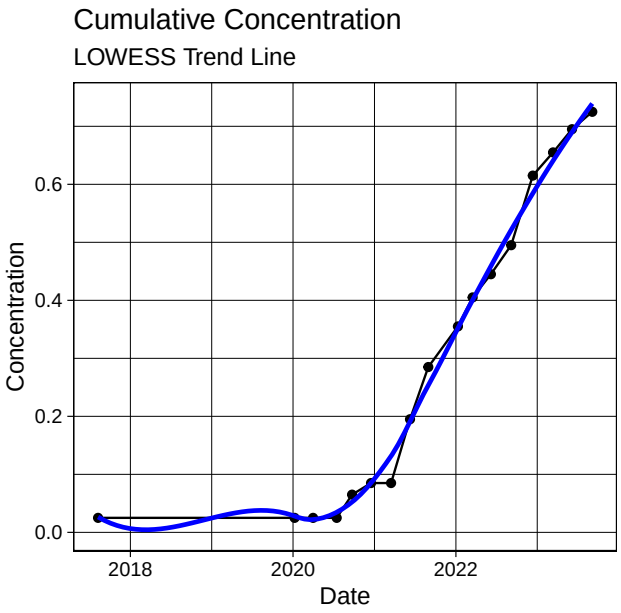




Kendall Trend Test Results Continuous	
n	17
z	1.51
p	0.13
S	37
varS	571
tau	0.29
mean	0.04
sd	0.04
cov	0.87
results	NO CLEAR TREND

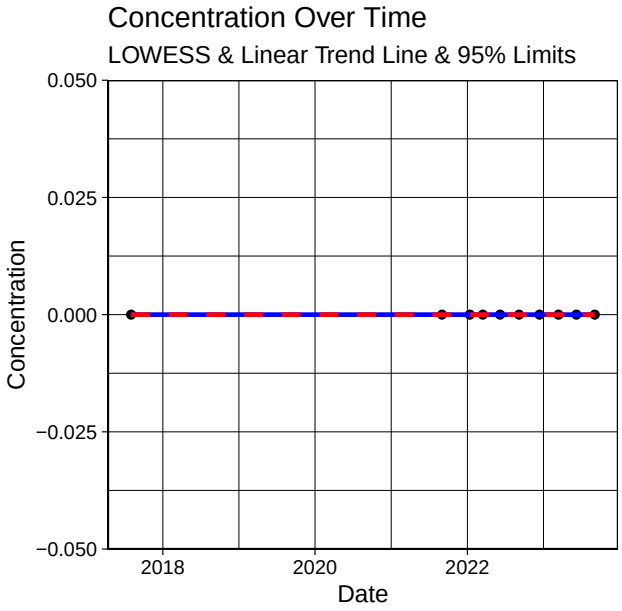
Report for ID : MW203 and Analyte : PFHxS + PFOS

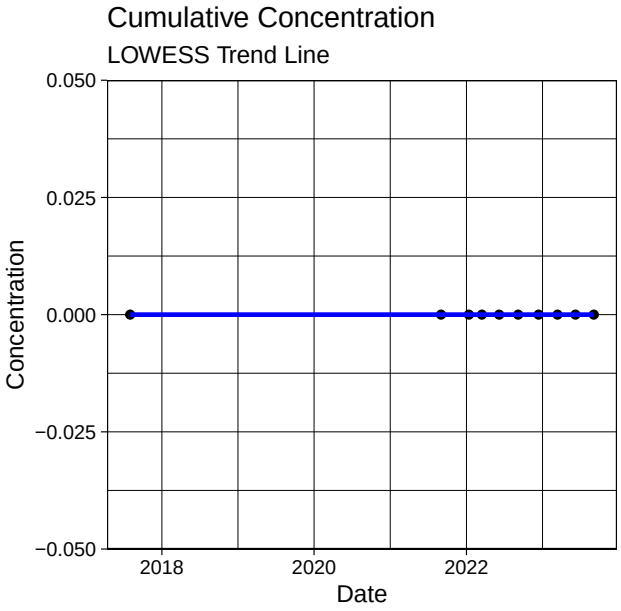




Kendall Trend Test Results Continuous	
n	10
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

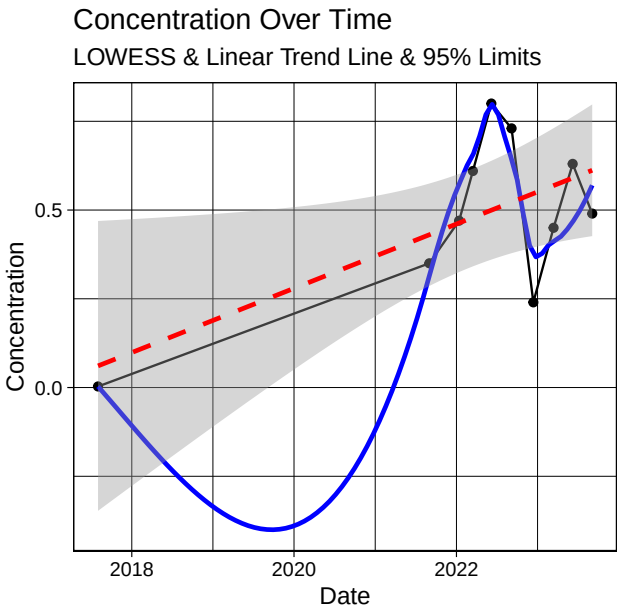
Report for ID : MW214 and Analyte : PFHxS + PFOS

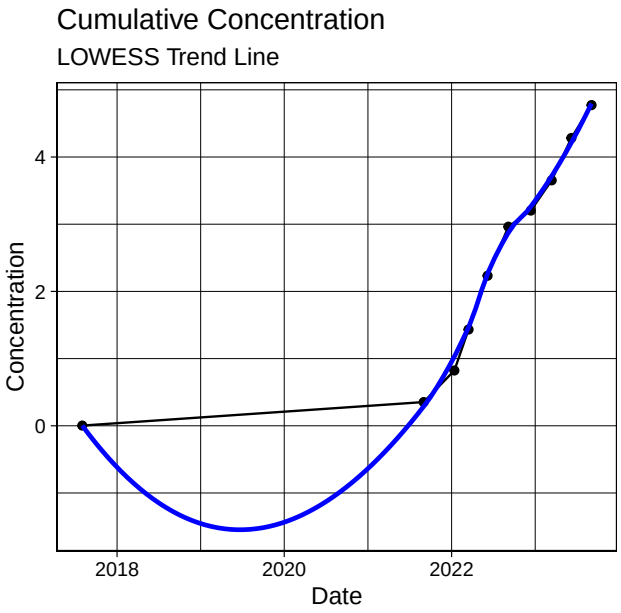




Kendall Trend Test Results Continuous	
n	10
z	1.07
p	0.28
S	13
varS	125
tau	0.29
mean	0.48
sd	0.24
cov	0.5
results	NO CLEAR TREND

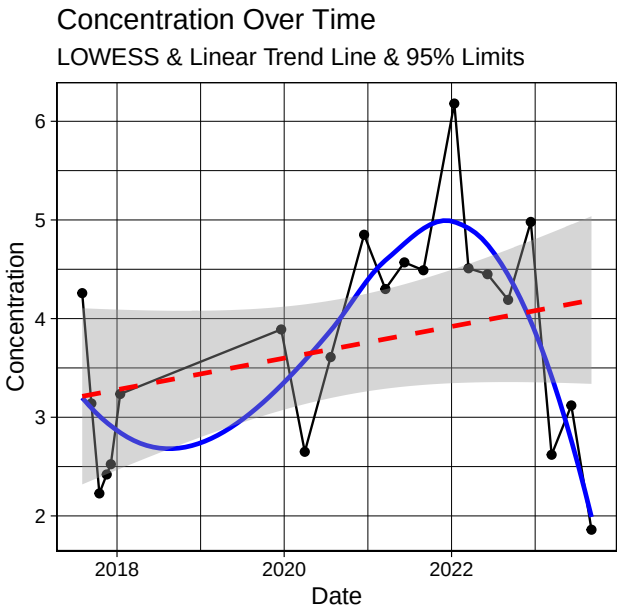
Report for ID : MW215 and Analyte : PFHxS + PFOS

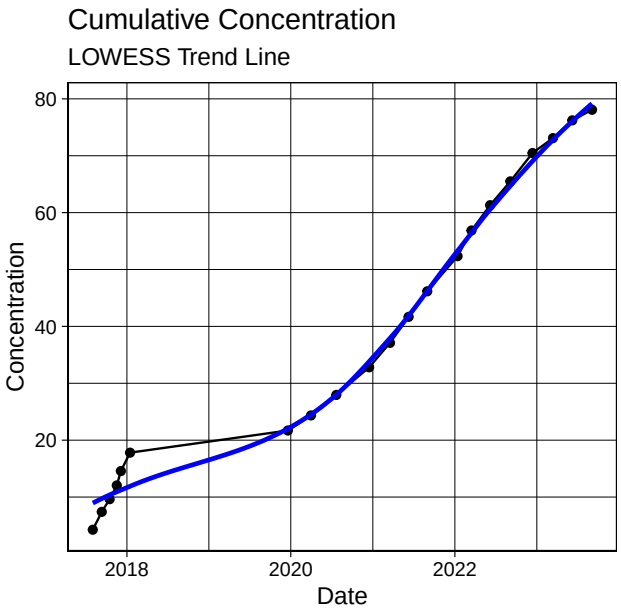




Kendall Trend Test Results Continuous	
n	21
z	1.18
p	0.24
S	40
varS	1096.67
tau	0.19
mean	3.72
sd	1.1
cov	0.3
results	NO CLEAR TREND

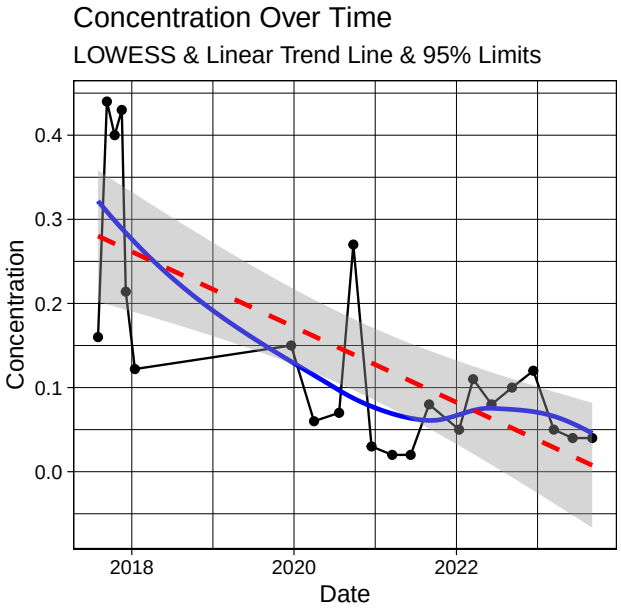
Report for ID : MW216 and Analyte : PFHxS + PFOS

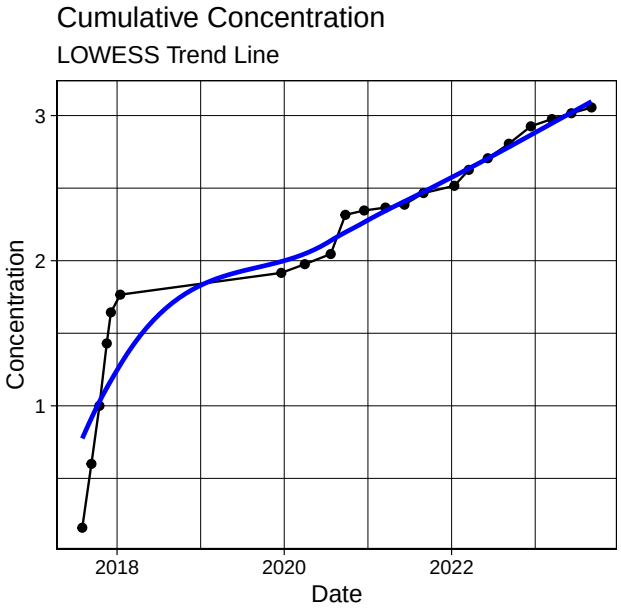




Kendall Trend Test Results Continuous	
n	22
z	-2.94
p	0
S	-105
varS	1253.67
tau	-0.46
mean	0.14
sd	0.13
cov	0.95
results	DECREASING

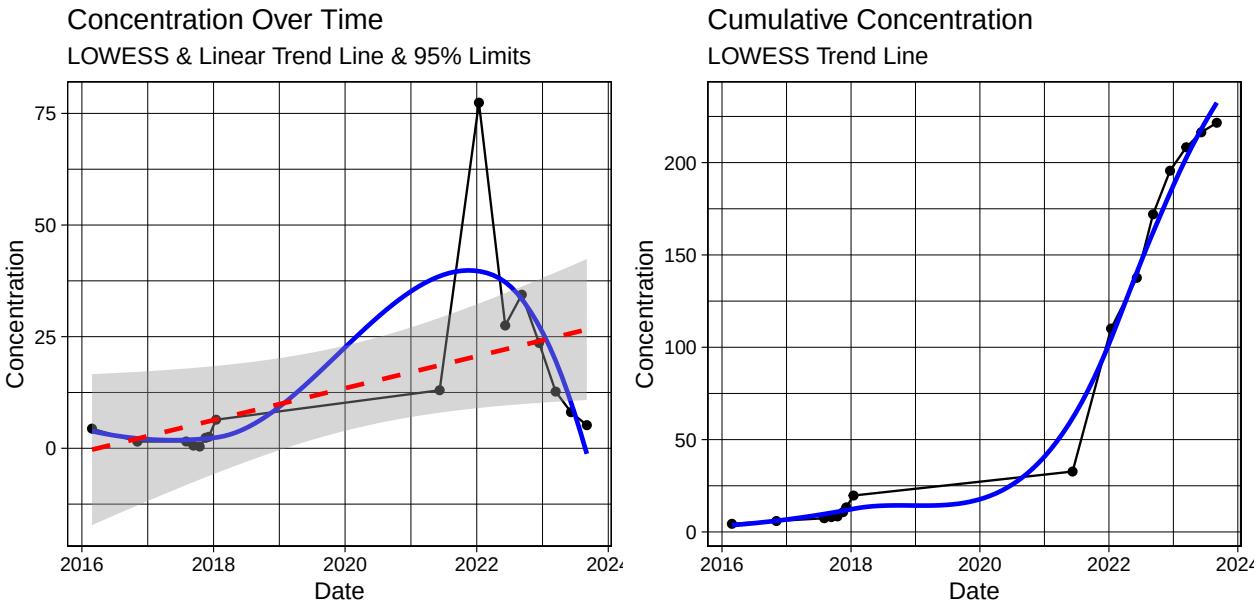
Report for ID : MW217 and Analyte : PFHxS + PFOS





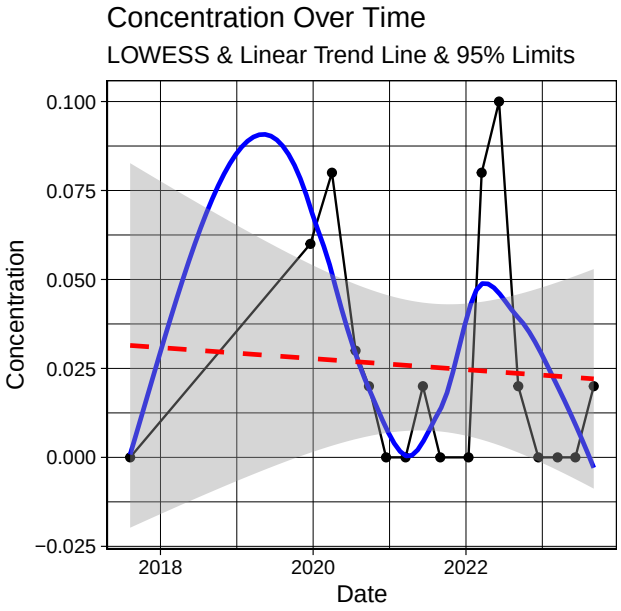
Kendall Trend Test Results Continuous	
n	16
z	2.21
p	0.03
S	50
varS	493.33
tau	0.42
mean	13.85
sd	19.86
cov	1.43
results	INCREASING

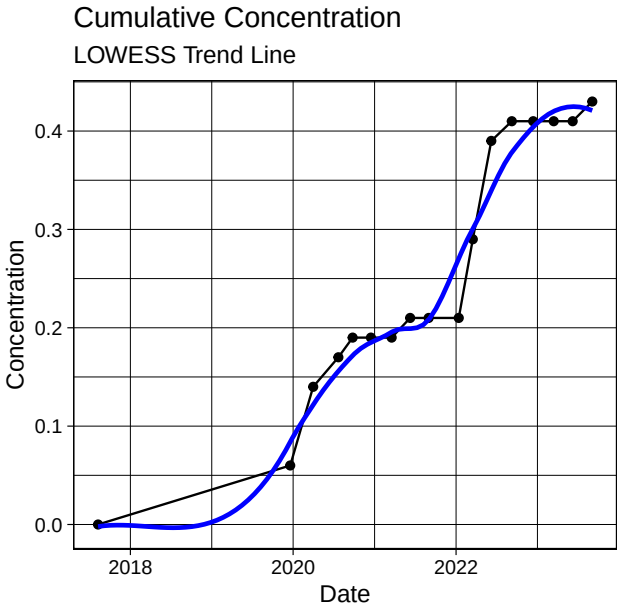
Report for ID : MW220 and Analyte : PFHxS + PFOS



Kendall Trend Test Results Continuous	
n	17
z	-0.79
p	0.43
S	-19
varS	514.33
tau	-0.16
mean	0.03
sd	0.03
cov	1.33
results	NO CLEAR TREND

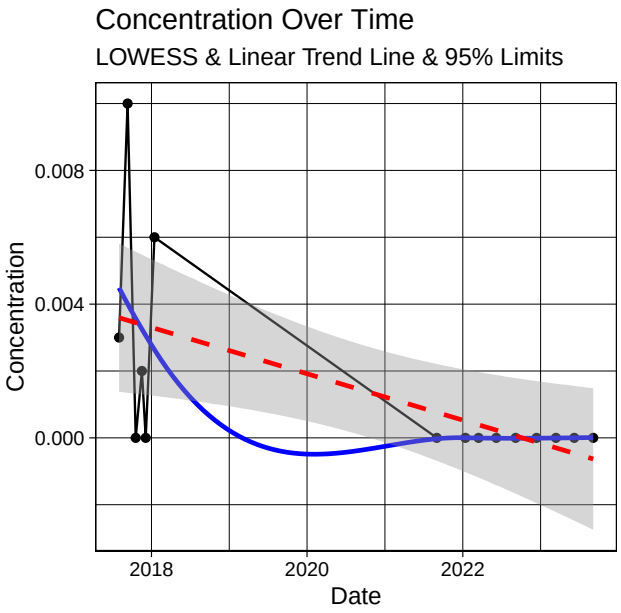
Report for ID : MW224 and Analyte : PFHxS + PFOS

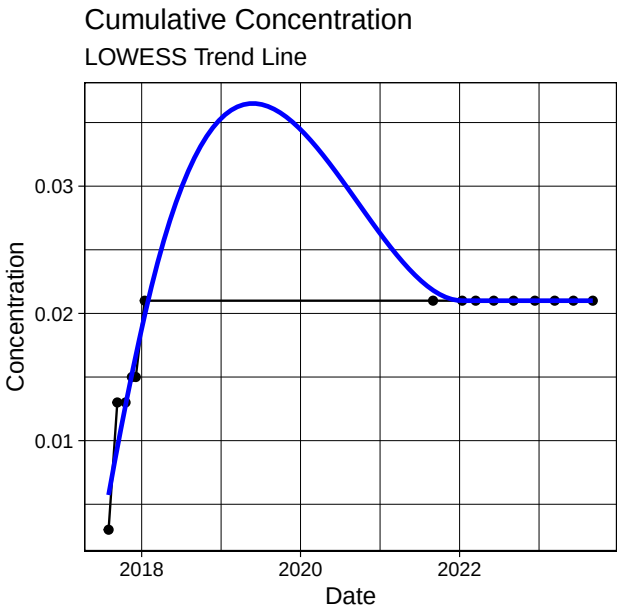




Kendall Trend Test Results Continuous	
n	15
z	-2.37
p	0.02
S	-38
varS	243.33
tau	-0.52
mean	0
sd	0
cov	2.09
results	DECREASING

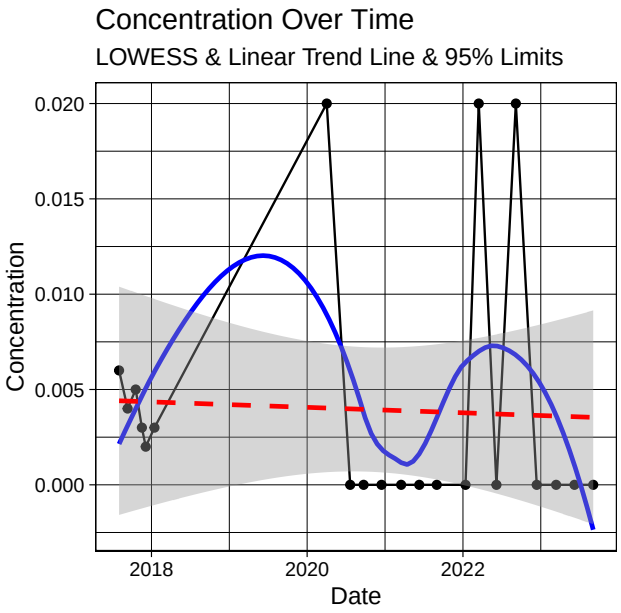
Report for ID : MW225 and Analyte : PFHxS + PFOS

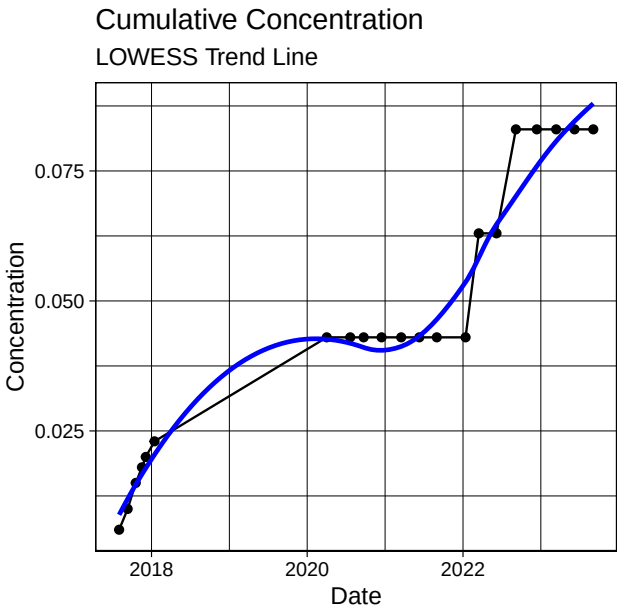




Kendall Trend Test Results Continuous	
n	21
z	-2.33
p	0.02
S	-70
varS	879.33
tau	-0.41
mean	0
sd	0.01
cov	1.76
results	DECREASING

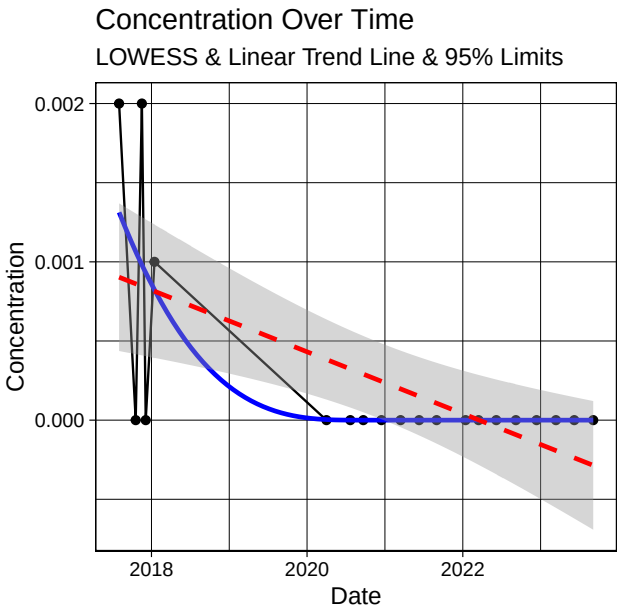
Report for ID : MW226 and Analyte : PFHxS + PFOS

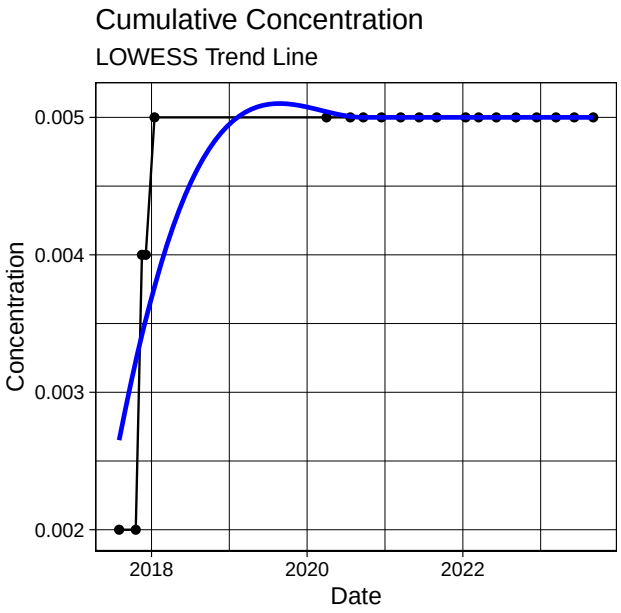




Kendall Trend Test Results Continuous	
n	20
z	-2.43
p	0.02
S	-47
varS	359.67
tau	-0.47
mean	0
sd	0
cov	2.55
results	DECREASING

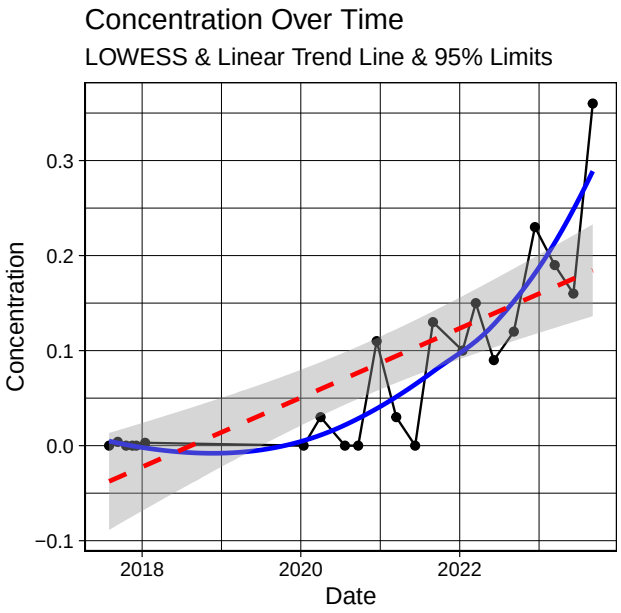
Report for ID : MW227 and Analyte : PFHxS + PFOS

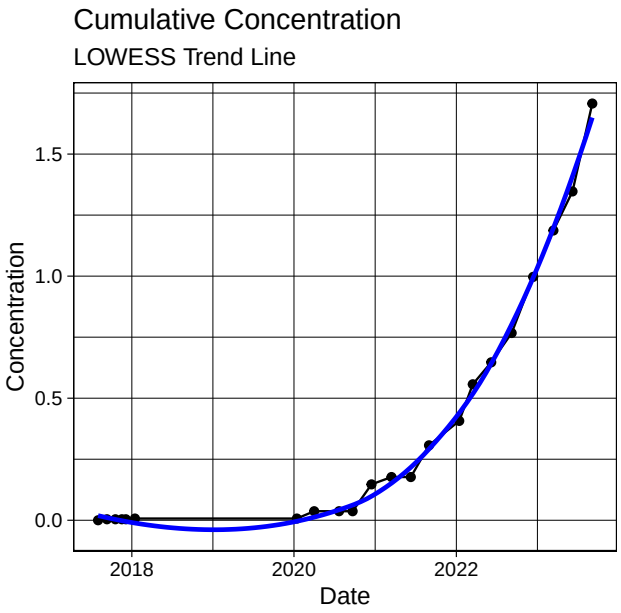




Kendall Trend Test Results Continuous	
n	22
z	4.14
p	0
S	144
varS	1191.33
tau	0.67
mean	0.08
sd	0.1
cov	1.25
results	INCREASING

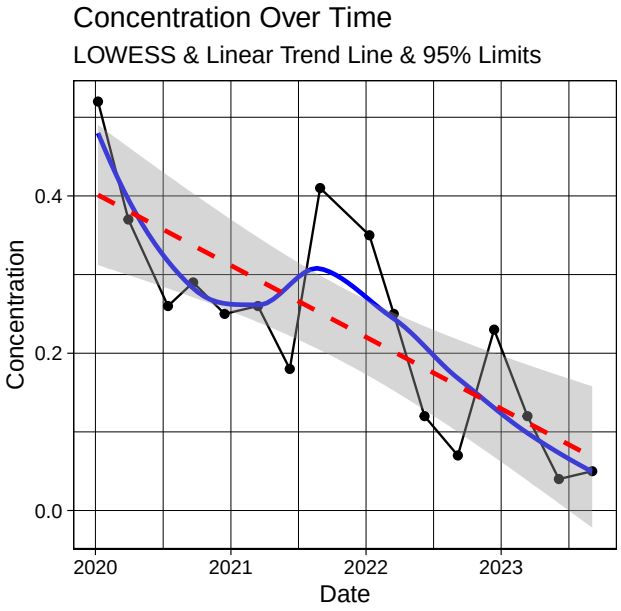
Report for ID : MW228 and Analyte : PFHxS + PFOS

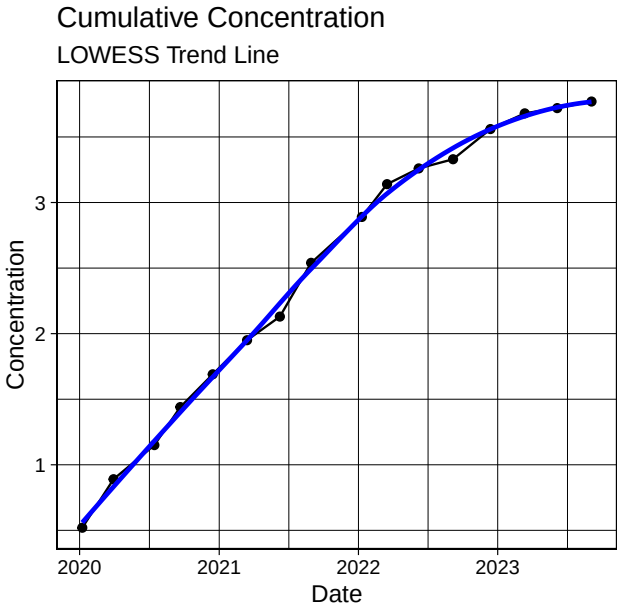




Kendall Trend Test Results Continuous	
n	16
z	-3.52
p	0
S	-79
varS	490.33
tau	-0.67
mean	0.24
sd	0.14
cov	0.58
results	DECREASING

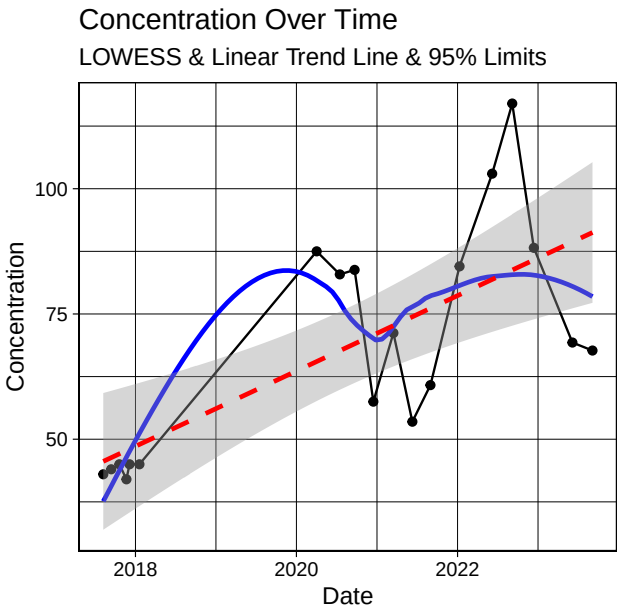
Report for ID : MW233 and Analyte : PFHxS + PFOS

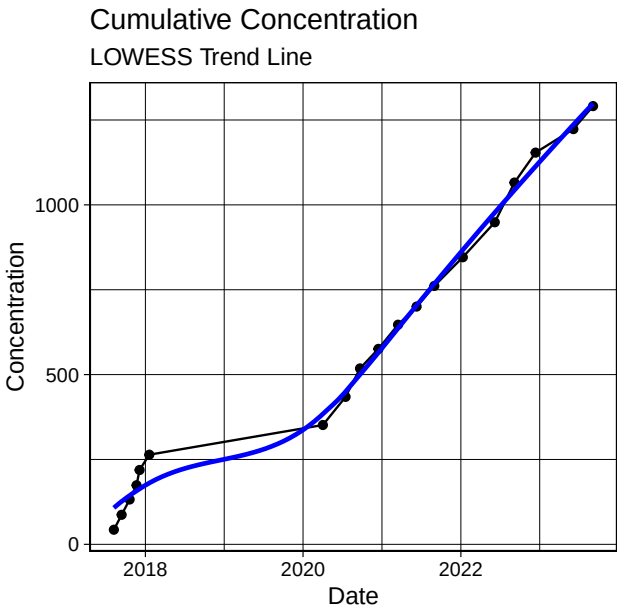




Kendall Trend Test Results Continuous	
n	19
z	3.05
p	0
S	88
varS	813.33
tau	0.52
mean	67.94
sd	22.37
cov	0.33
results	INCREASING

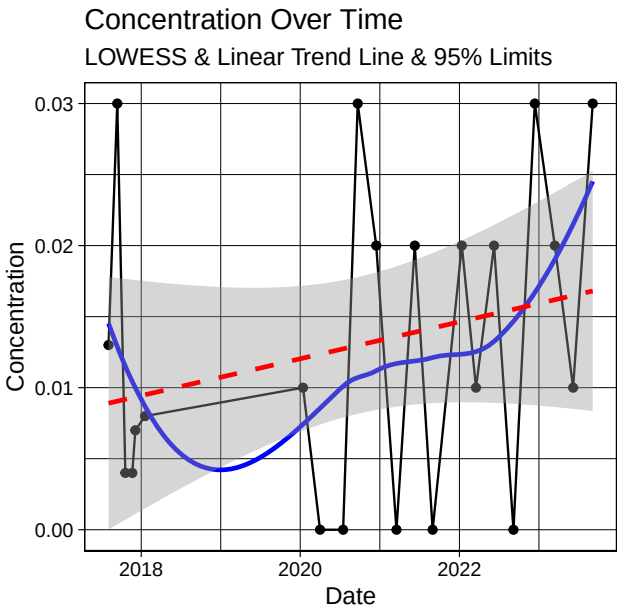
Report for ID : MW236 and Analyte : PFHxS + PFOS

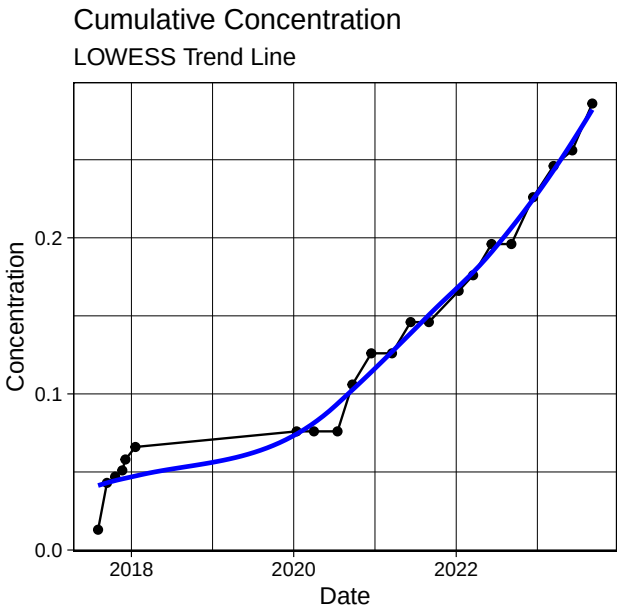




Kendall Trend Test Results Continuous	
n	22
z	1.03
p	0.3
S	37
varS	1211
tau	0.17
mean	0.01
sd	0.01
cov	0.84
results	NO CLEAR TREND

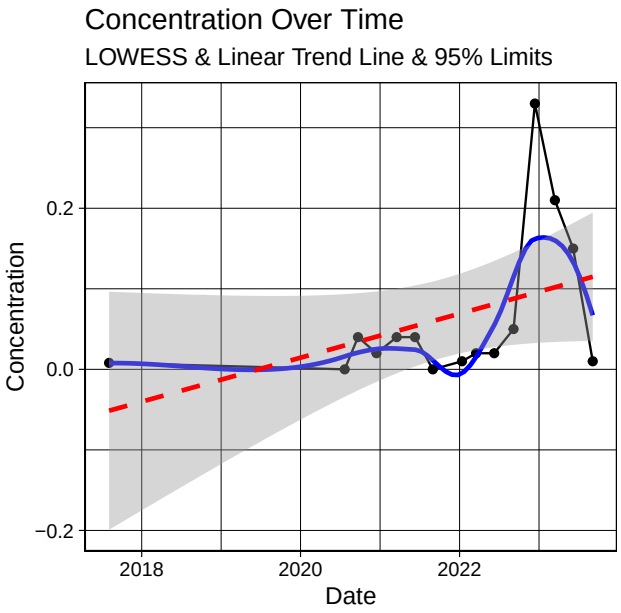
Report for ID : MW238 and Analyte : PFHxS + PFOS

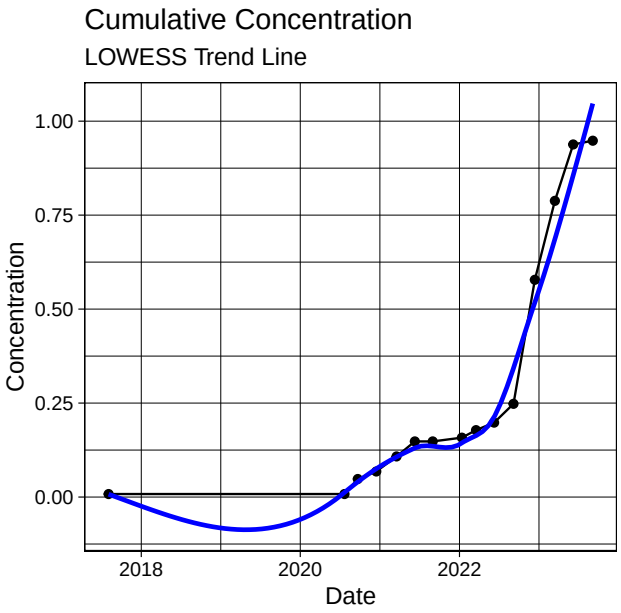




Kendall Trend Test Results Continuous	
n	15
z	1.8
p	0.07
S	37
varS	399
tau	0.37
mean	0.06
sd	0.09
cov	1.49
results	POSSIBLY INCREASING

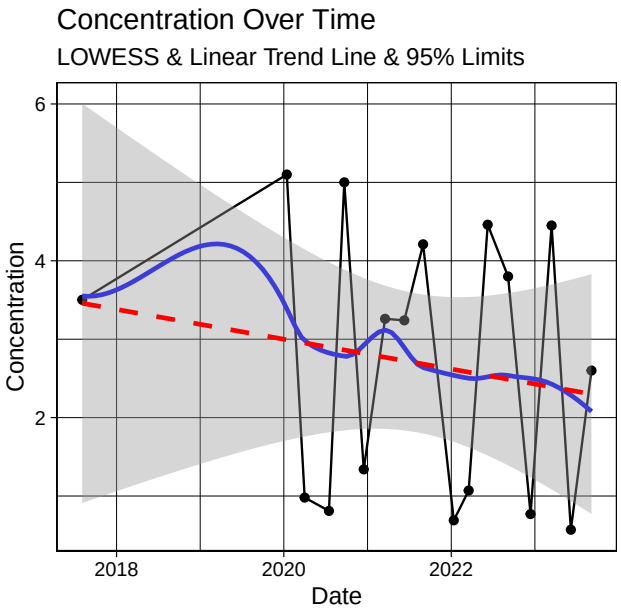
Report for ID : MW239 and Analyte : PFHxS + PFOS

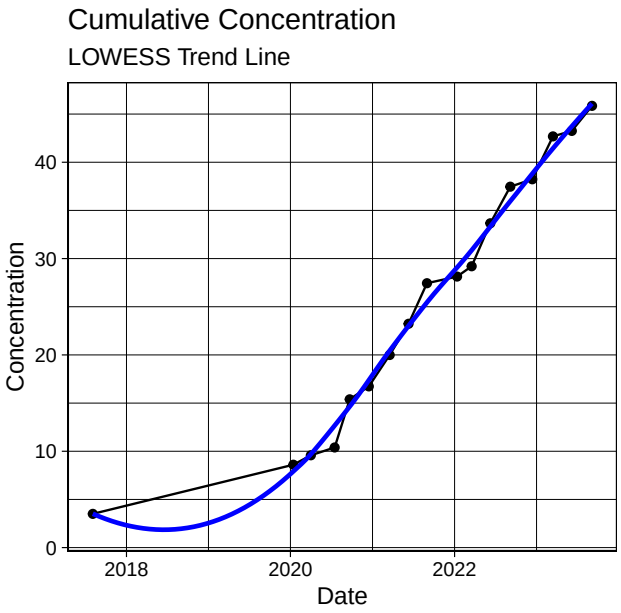




Kendall Trend Test Results Continuous	
n	17
z	-0.87
p	0.39
S	-22
varS	589.33
tau	-0.16
mean	2.7
sd	1.68
cov	0.62
results	STABLE

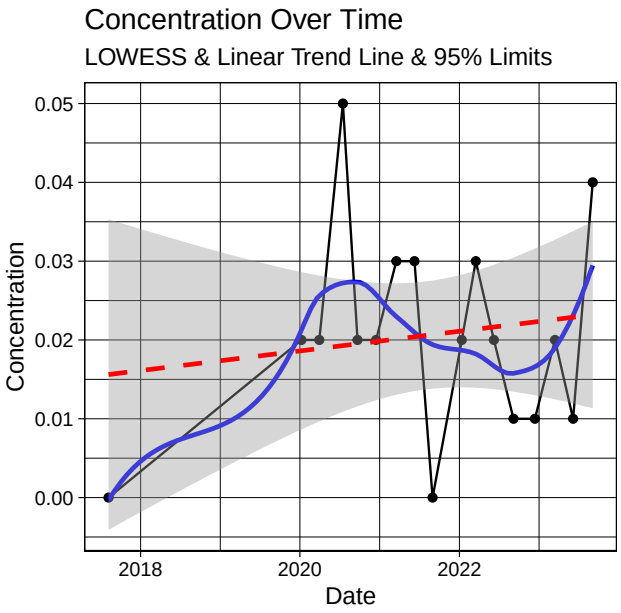
Report for ID : MW240 and Analyte : PFHxS + PFOS

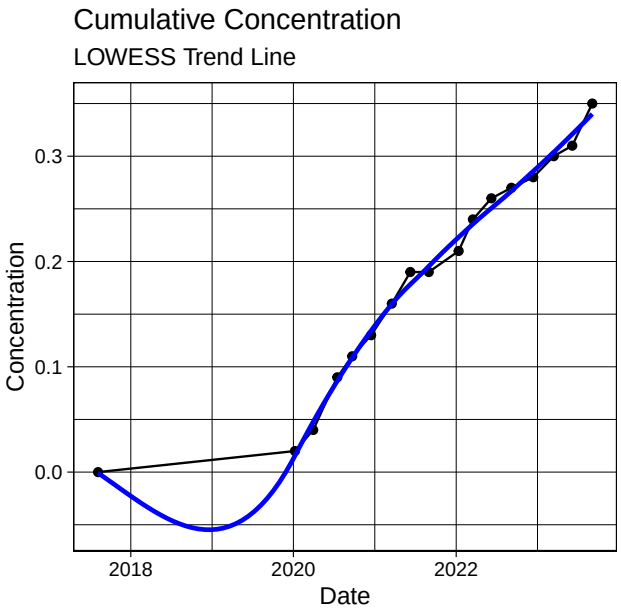




Kendall Trend Test Results Continuous	
n	17
z	-0.04
p	0.97
S	-2
varS	536.67
tau	-0.02
mean	0.02
sd	0.01
cov	0.63
results	STABLE

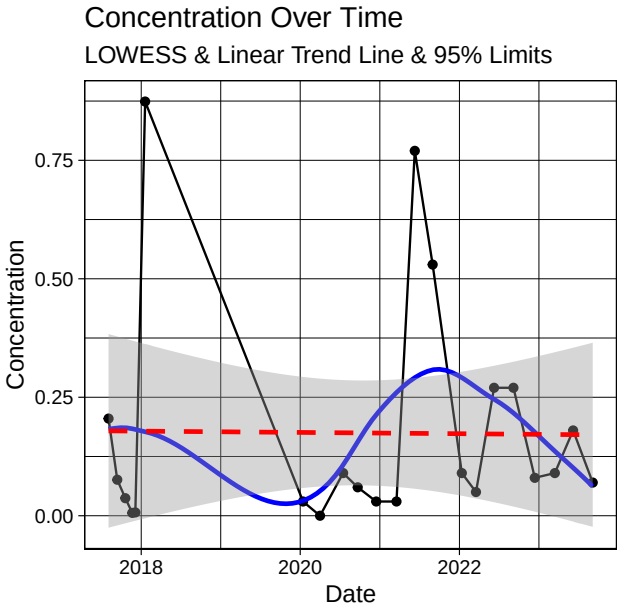
Report for ID : MW242 and Analyte : PFHxS + PFOS

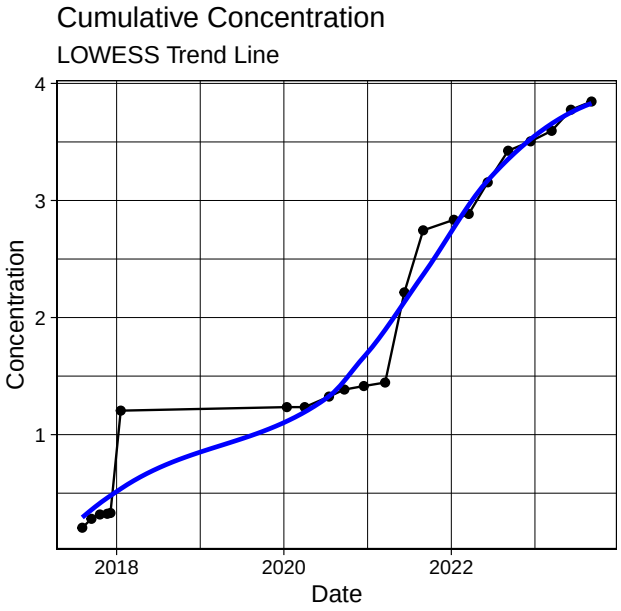




Kendall Trend Test Results Continuous	
n	22
z	1.16
p	0.25
S	42
varS	1249.33
tau	0.18
mean	0.17
sd	0.24
cov	1.39
results	NO CLEAR TREND

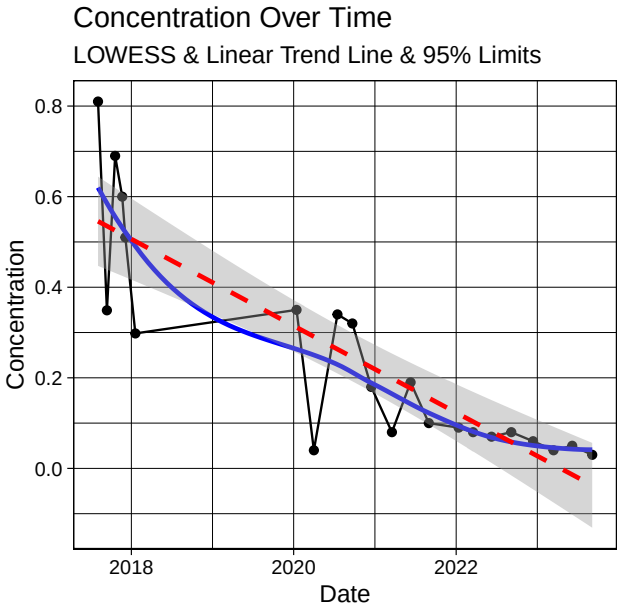
Report for ID : MW243 and Analyte : PFHxS + PFOS

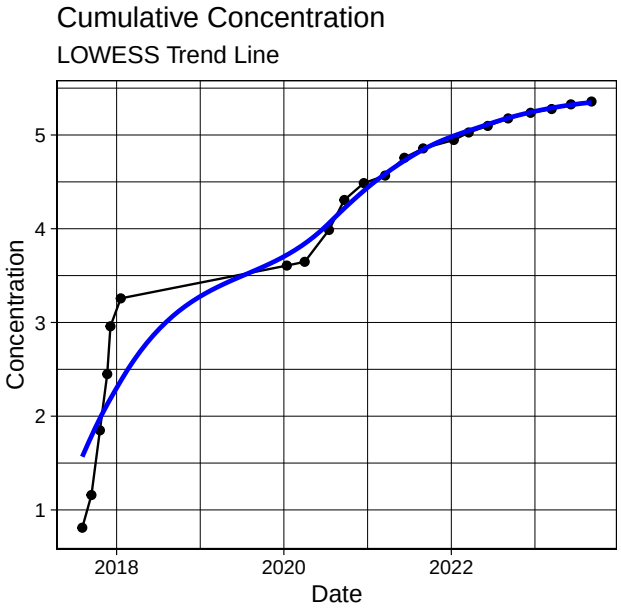




Kendall Trend Test Results Continuous	
n	22
z	-4.97
p	0
S	-177
varS	1253
tau	-0.77
mean	0.24
sd	0.23
cov	0.95
results	DECREASING

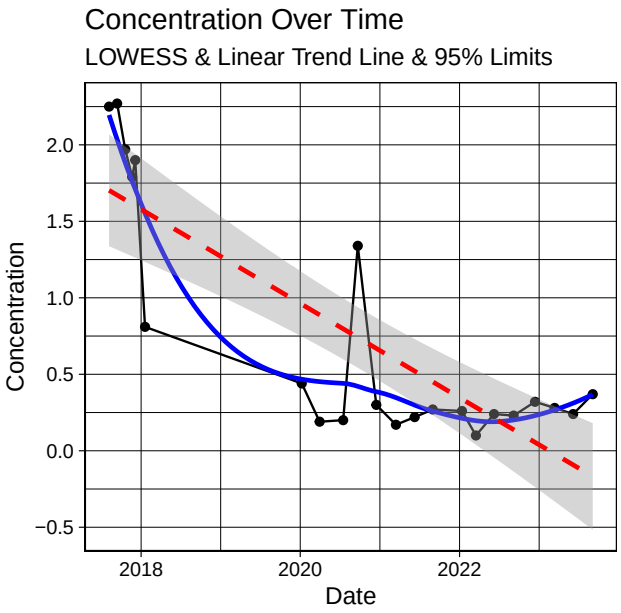
Report for ID : MW245 and Analyte : PFHxS + PFOS

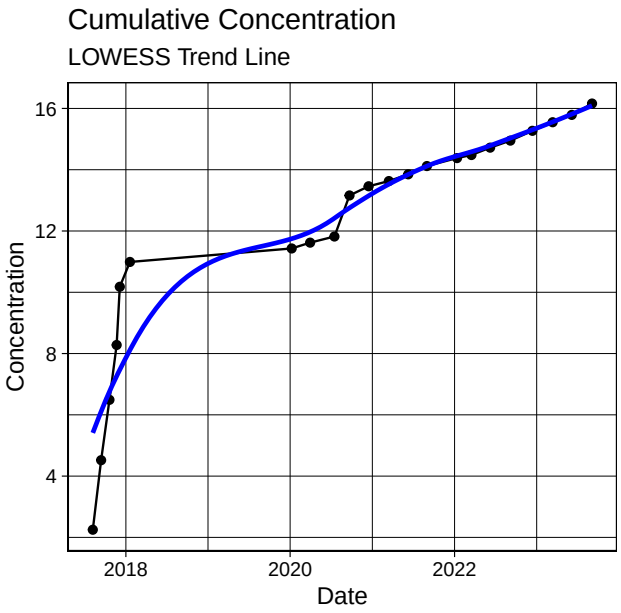




Kendall Trend Test Results Continuous	
n	22
z	-2.62
p	0.01
S	-94
varS	1256.67
tau	-0.41
mean	0.73
sd	0.77
cov	1.05
results	DECREASING

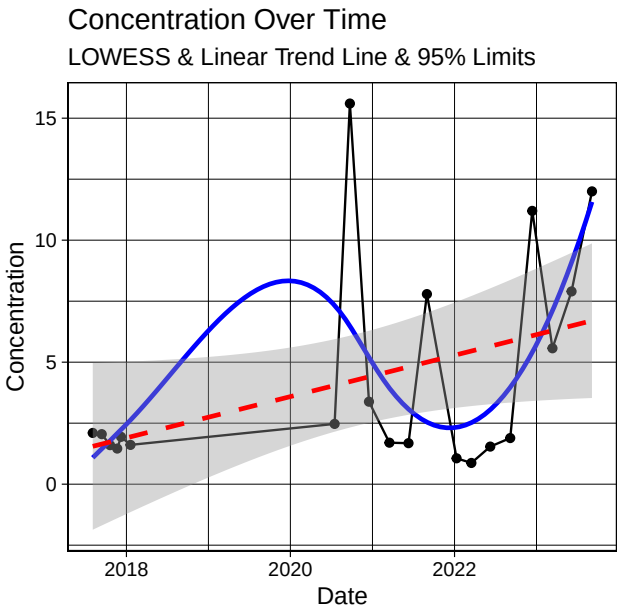
Report for ID : MW249 and Analyte : PFHxS + PFOS

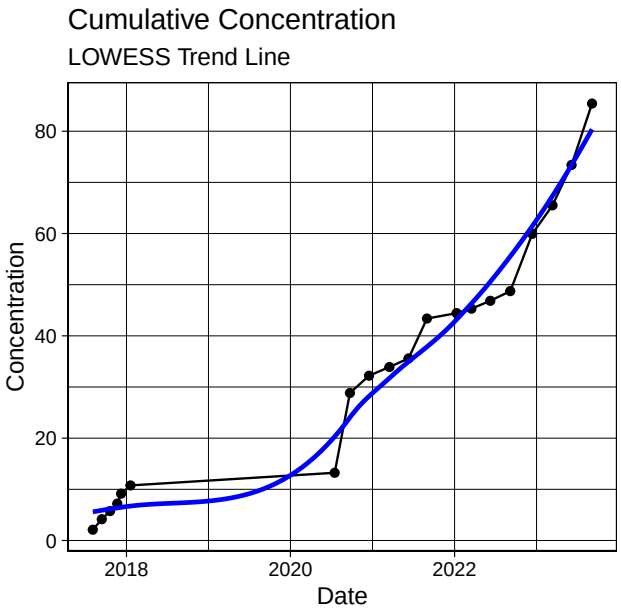




Kendall Trend Test Results Continuous	
n	20
z	1.2
p	0.23
S	38
varS	950
tau	0.2
mean	4.27
sd	4.31
cov	1.01
results	NO CLEAR TREND

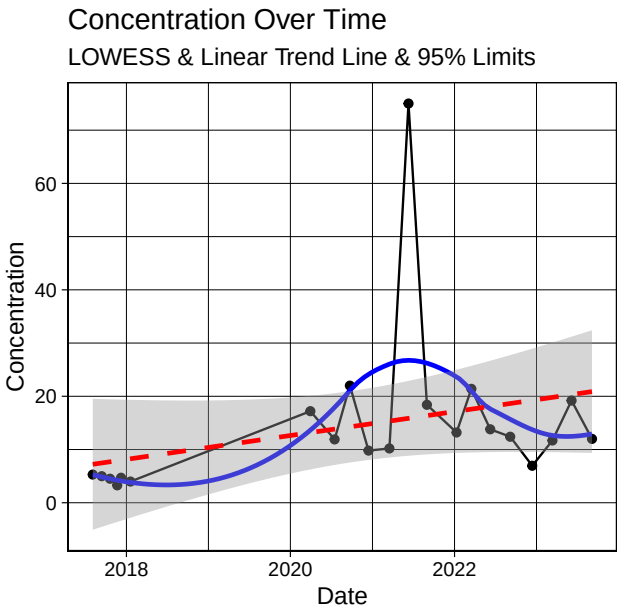
Report for ID : MW255 and Analyte : PFHxS + PFOS

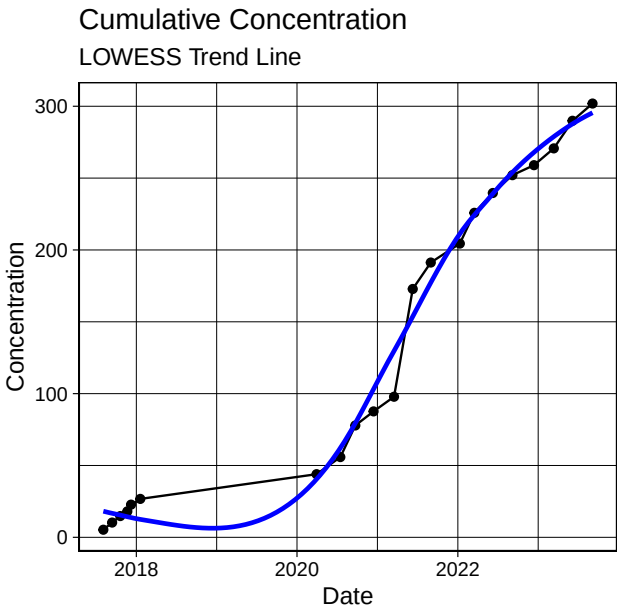




Kendall Trend Test Results Continuous	
n	21
z	2.02
p	0.04
S	68
varS	1096.67
tau	0.32
mean	14.38
sd	15.07
cov	1.05
results	INCREASING

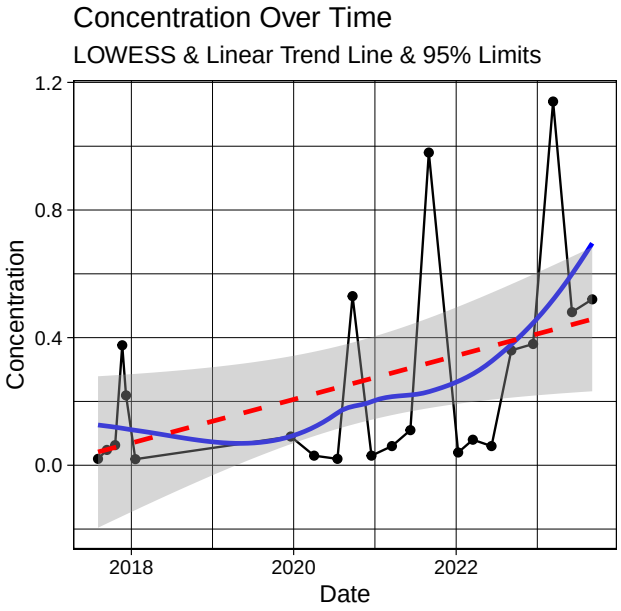
Report for ID : MW256 and Analyte : PFHxS + PFOS

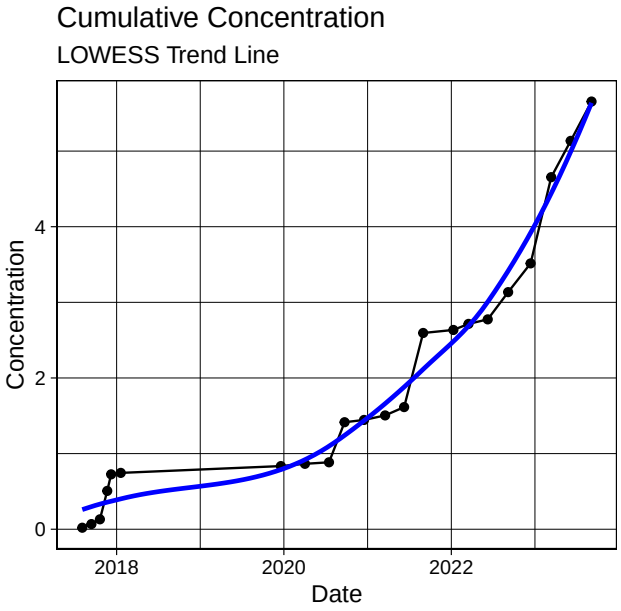




Kendall Trend Test Results Continuous	
n	22
z	2.63
p	0.01
S	94
varS	1254.67
tau	0.41
mean	0.26
sd	0.32
cov	1.23
results	INCREASING

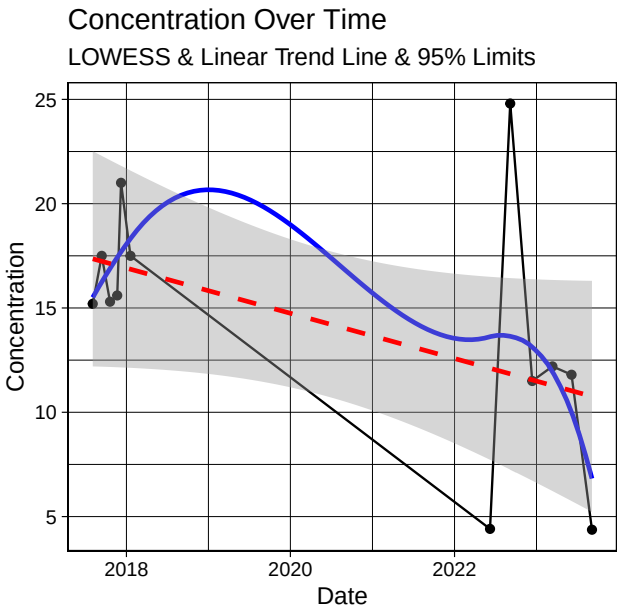
Report for ID : MW257 and Analyte : PFHxS + PFOS

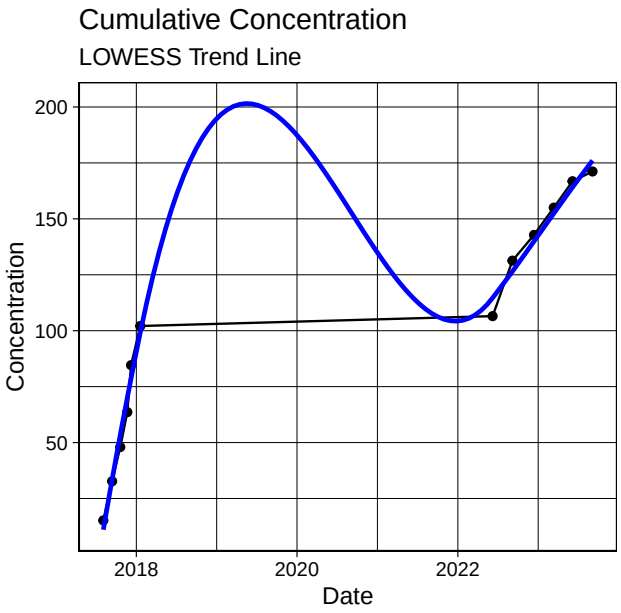




Kendall Trend Test Results Continuous	
n	12
z	-1.24
p	0.22
S	-19
varS	211.67
tau	-0.29
mean	14.27
sd	5.98
cov	0.42
results	STABLE

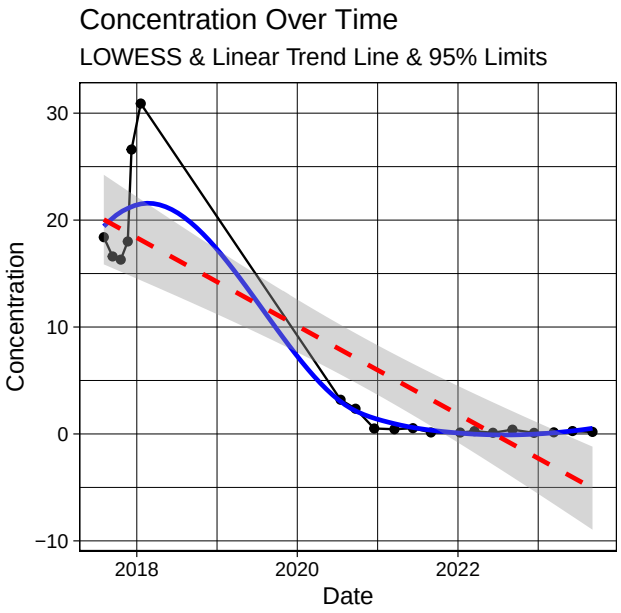
Report for ID : MW258 and Analyte : PFHxS + PFOS

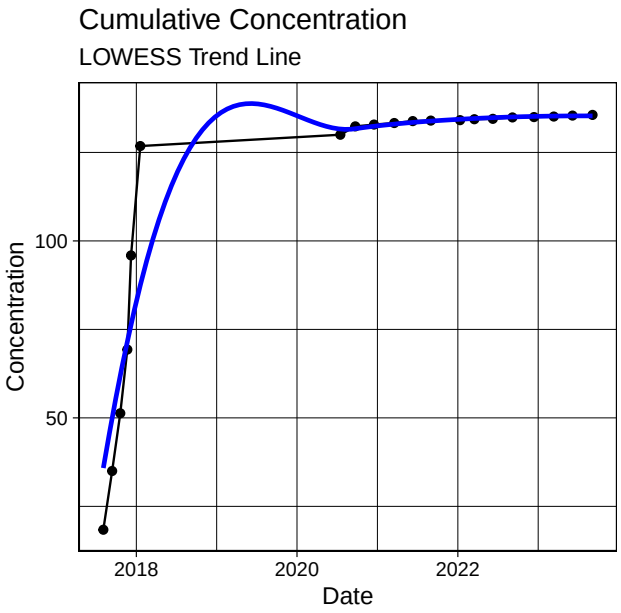




Kendall Trend Test Results Continuous	
n	20
z	-3.93
p	0
S	-122
varS	950
tau	-0.64
mean	6.78
sd	10.17
cov	1.5
results	DECREASING

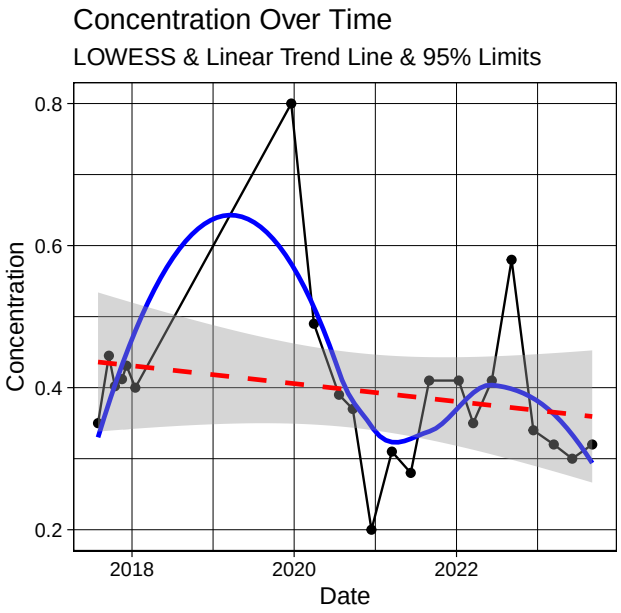
Report for ID : MW259 and Analyte : PFHxS + PFOS

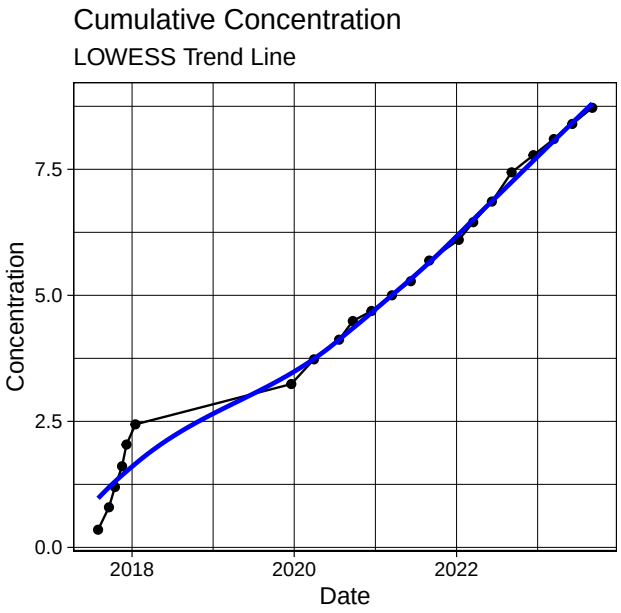




Kendall Trend Test Results Continuous	
n	22
z	-1.84
p	0.07
S	-66
varS	1252
tau	-0.29
mean	0.4
sd	0.12
cov	0.3
results	POSSIBLY DECREASING

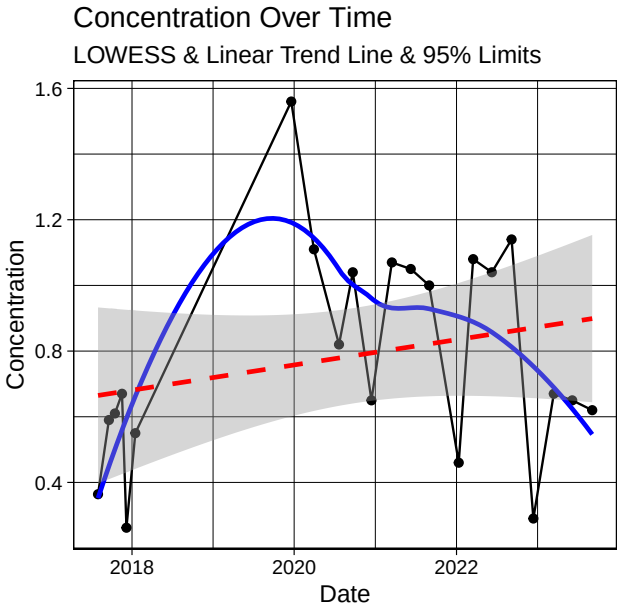
Report for ID : MW268 and Analyte : PFHxS + PFOS

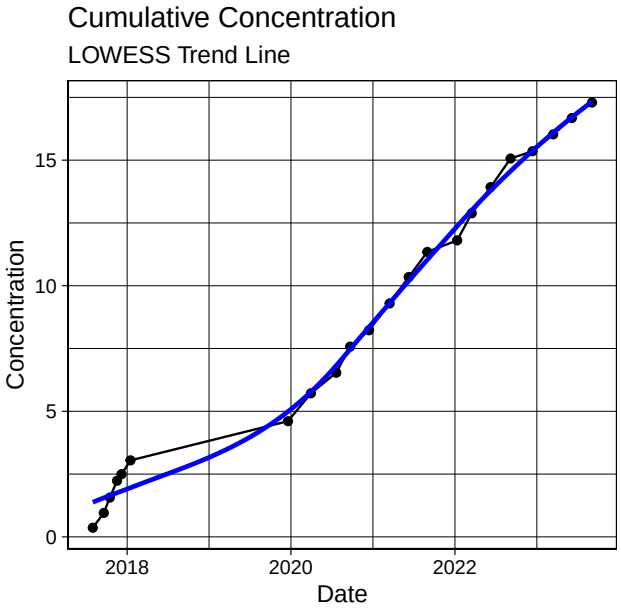




Kendall Trend Test Results Continuous	
n	22
z	0.76
p	0.45
S	28
varS	1254.67
tau	0.12
mean	0.79
sd	0.33
cov	0.42
results	NO CLEAR TREND

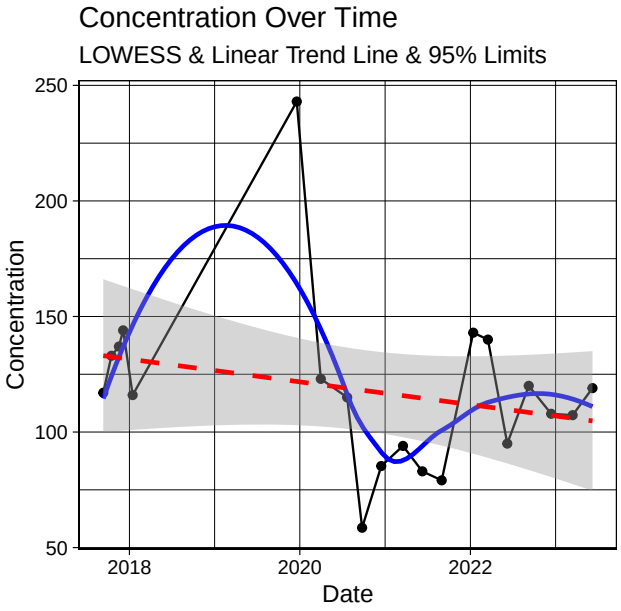
Report for ID : MW269 and Analyte : PFHxS + PFOS

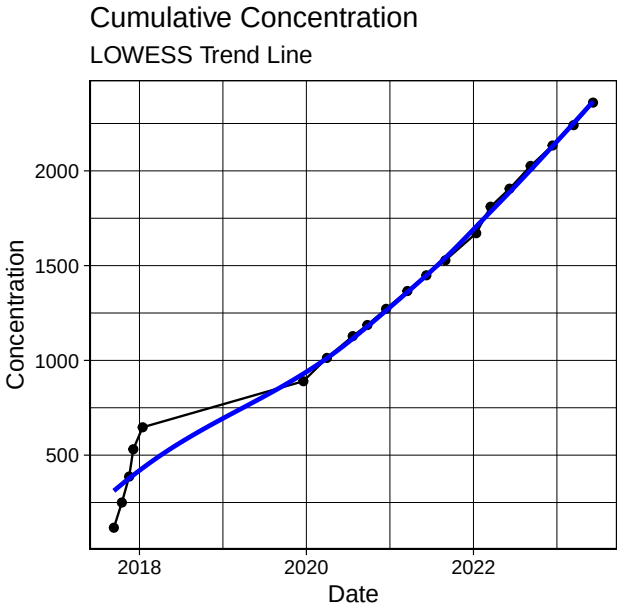




Kendall Trend Test Results Continuous	
n	20
z	-1.14
p	0.26
S	-36
varS	950
tau	-0.19
mean	118.01
sd	37.48
cov	0.32
results	STABLE

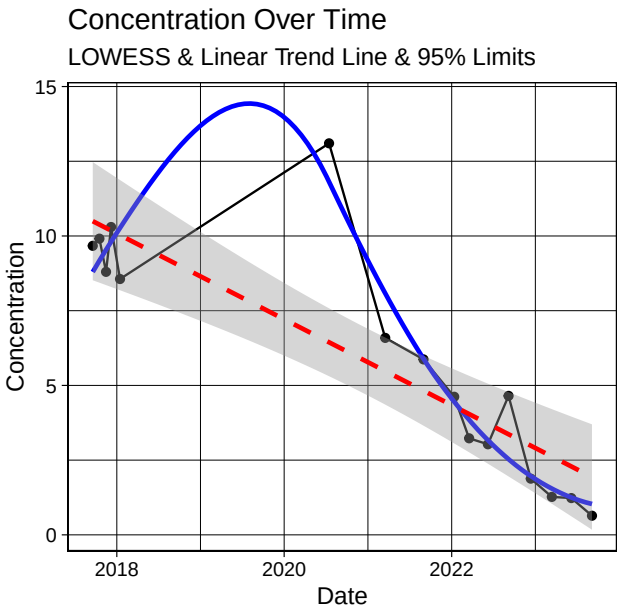
Report for ID : MW282 and Analyte : PFHxS + PFOS

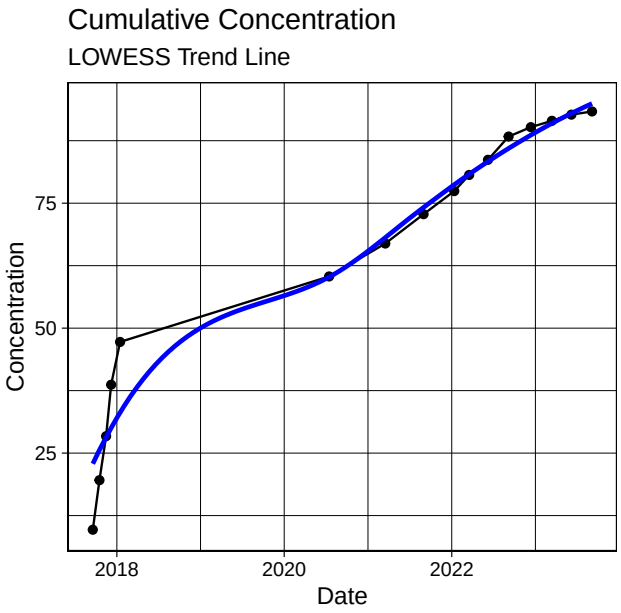




Kendall Trend Test Results Continuous	
n	16
z	-4.28
p	0
S	-96
varS	493.33
tau	-0.8
mean	5.83
sd	3.86
cov	0.66
results	DECREASING

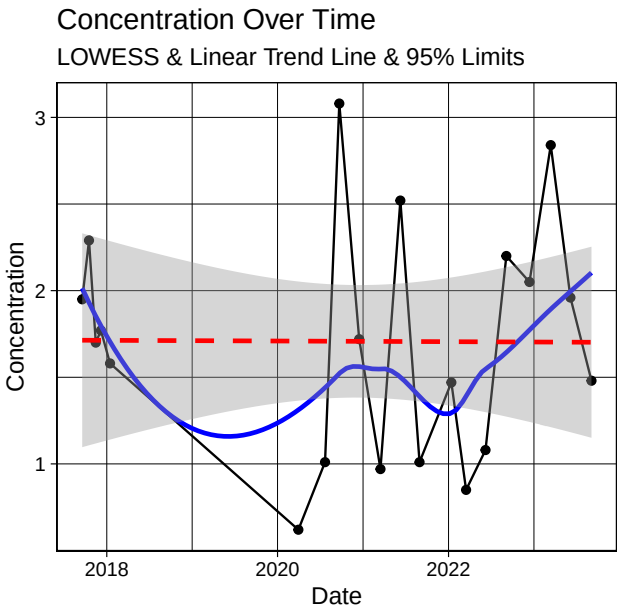
Report for ID : MW288 and Analyte : PFHxS + PFOS

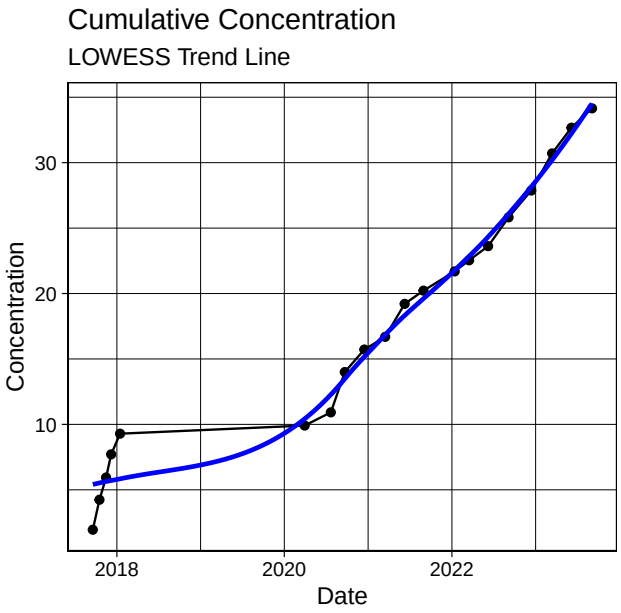




Kendall Trend Test Results Continuous	
n	20
z	0
p	1
S	1
varS	949
tau	0.01
mean	1.71
sd	0.67
cov	0.39
results	NO CLEAR TREND

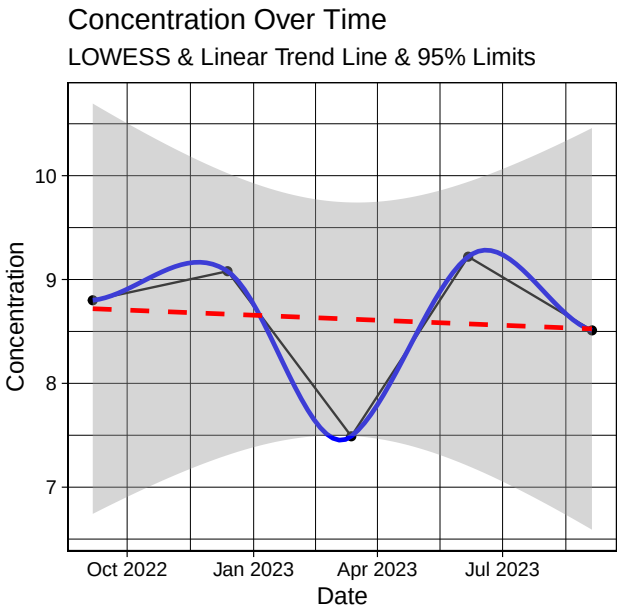
Report for ID : MW289 and Analyte : PFHxS + PFOS

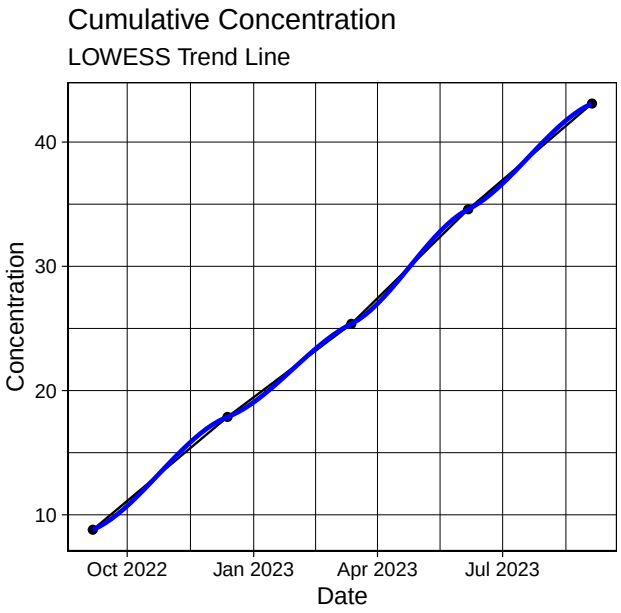




Kendall Trend Test Results Continuous	
n	5
z	0
p	1
S	0
varS	16.67
tau	0
mean	8.62
sd	0.69
cov	0.08
results	STABLE

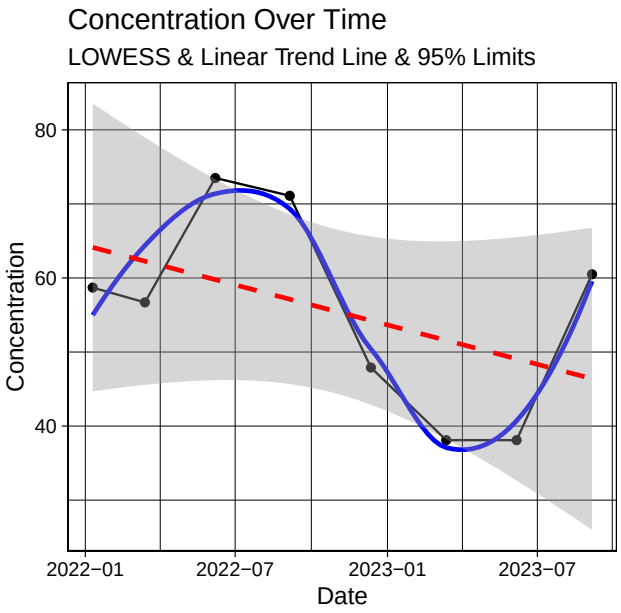
Report for ID : MW496 and Analyte : PFHxS + PFOS

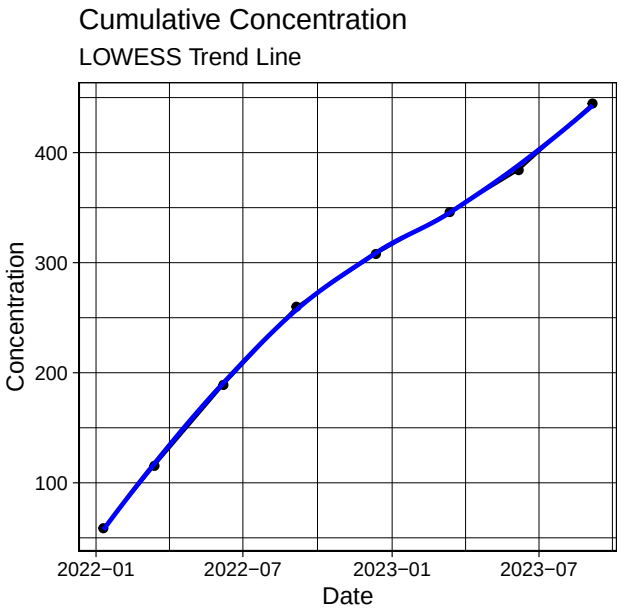




Kendall Trend Test Results Continuous	
n	8
z	-1
p	0.32
S	-9
varS	64.33
tau	-0.33
mean	55.58
sd	13.46
cov	0.24
results	STABLE

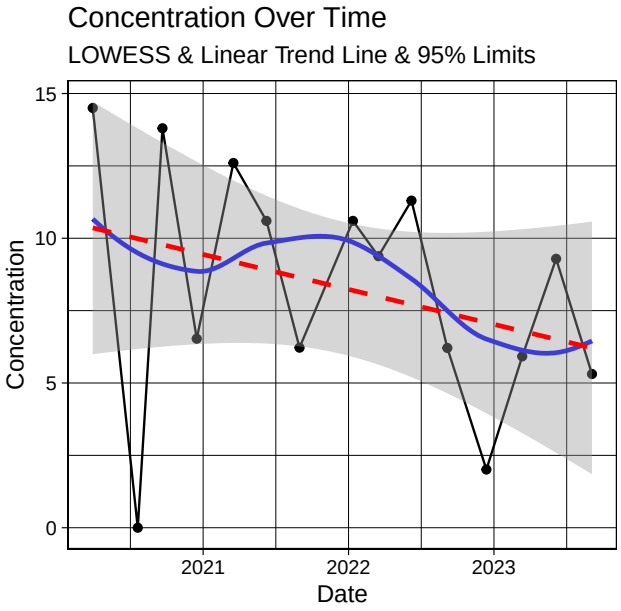
Report for ID : MW500 and Analyte : PFHxS + PFOS

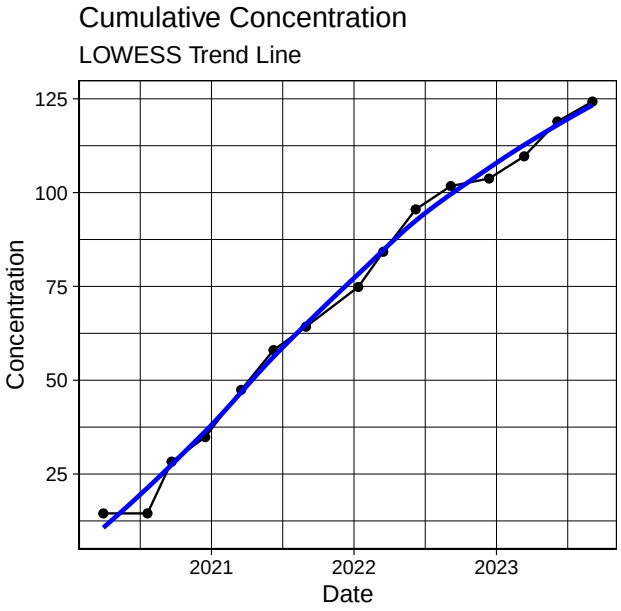




Kendall Trend Test Results Continuous	
n	15
z	-2.03
p	0.04
S	-42
varS	407.33
tau	-0.4
mean	8.28
sd	4.17
cov	0.5
results	DECREASING

Report for ID : MW516 and Analyte : PFHxS + PFOS





Trend Report

Report Date & Time: 2024-04-21 08:20:49

Data File Name: 0089_MKA_PFOS_input.csv

Report Title: Groundwater PFOS Trend

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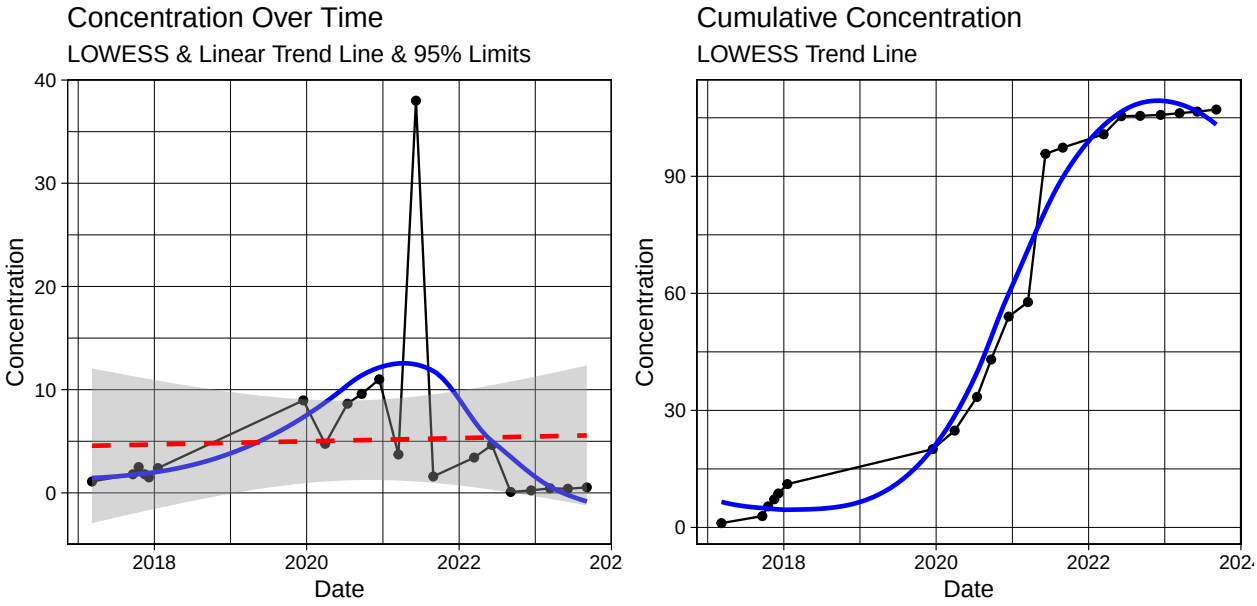
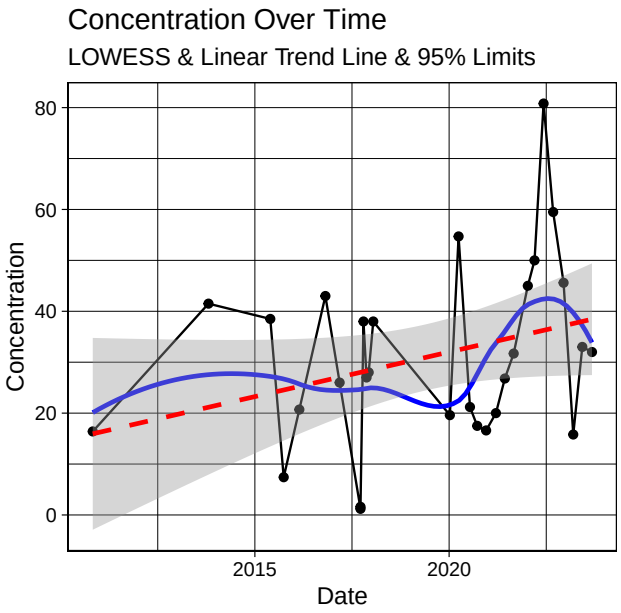
Kendall Trend Test Results Continuous	
n	21
z	-0.73
p	0.47
S	-25
varS	1095.67
tau	-0.12
mean	5.1
sd	8.25
cov	1.62
results	NO CLEAR TREND

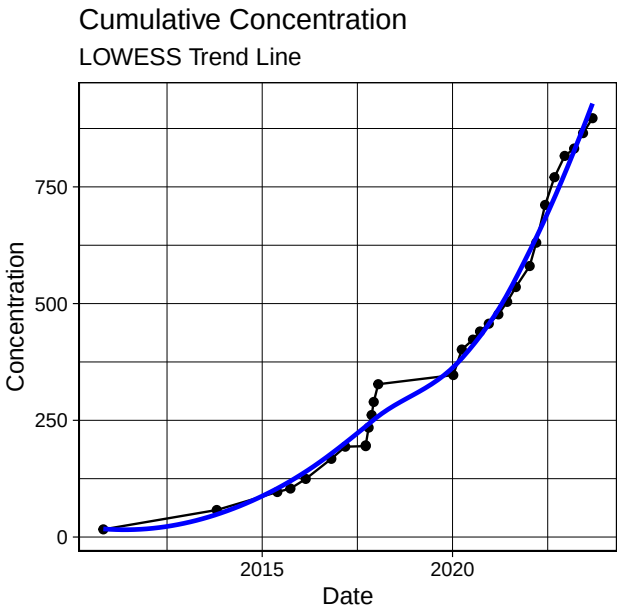
Report for ID : MW109 and Analyte : PFOS



Kendall Trend Test Results Continuous	
n	29
z	1.65
p	0.1
S	89
varS	2841
tau	0.22
mean	30.93
sd	17.63
cov	0.57
results	POSSIBLY INCREASING

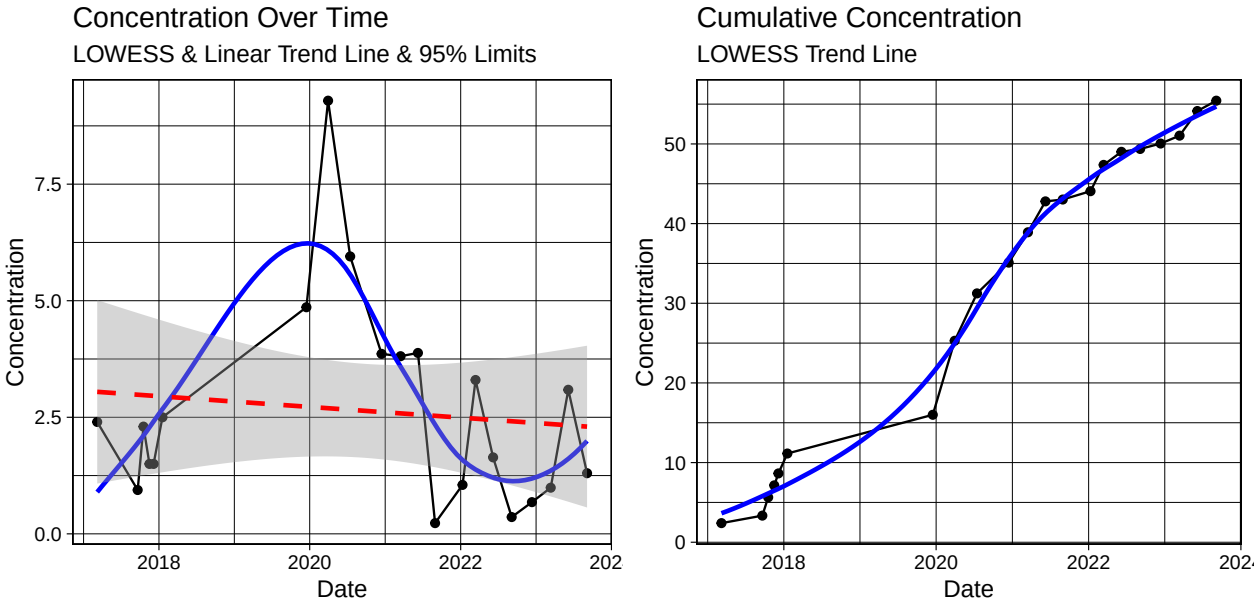
Report for ID : MW112 and Analyte : PFOS





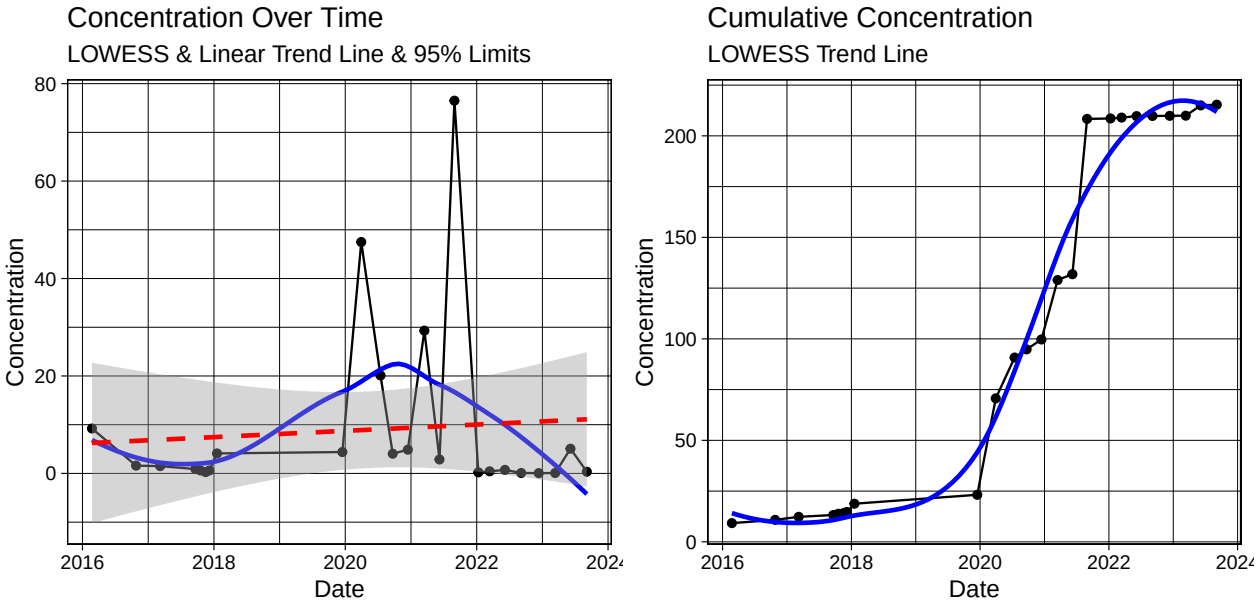
Kendall Trend Test Results Continuous	
n	21
z	-0.97
p	0.33
S	-33
varS	1095.67
tau	-0.16
mean	2.64
sd	2.16
cov	0.82
results	STABLE

Report for ID : MW120 and Analyte : PFOS



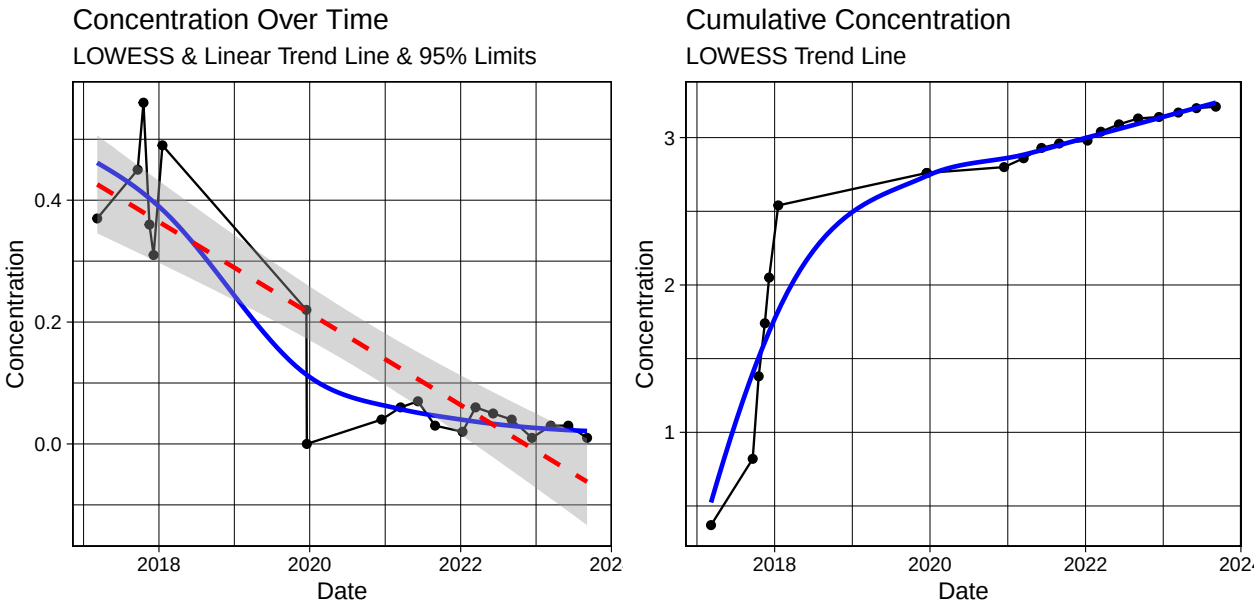
Kendall Trend Test Results Continuous	
n	24
z	-1.36
p	0.17
S	-56
varS	1625.33
tau	-0.2
mean	8.97
sd	18.23
cov	2.03
results	NO CLEAR TREND

Report for ID : MW121 and Analyte : PFOS



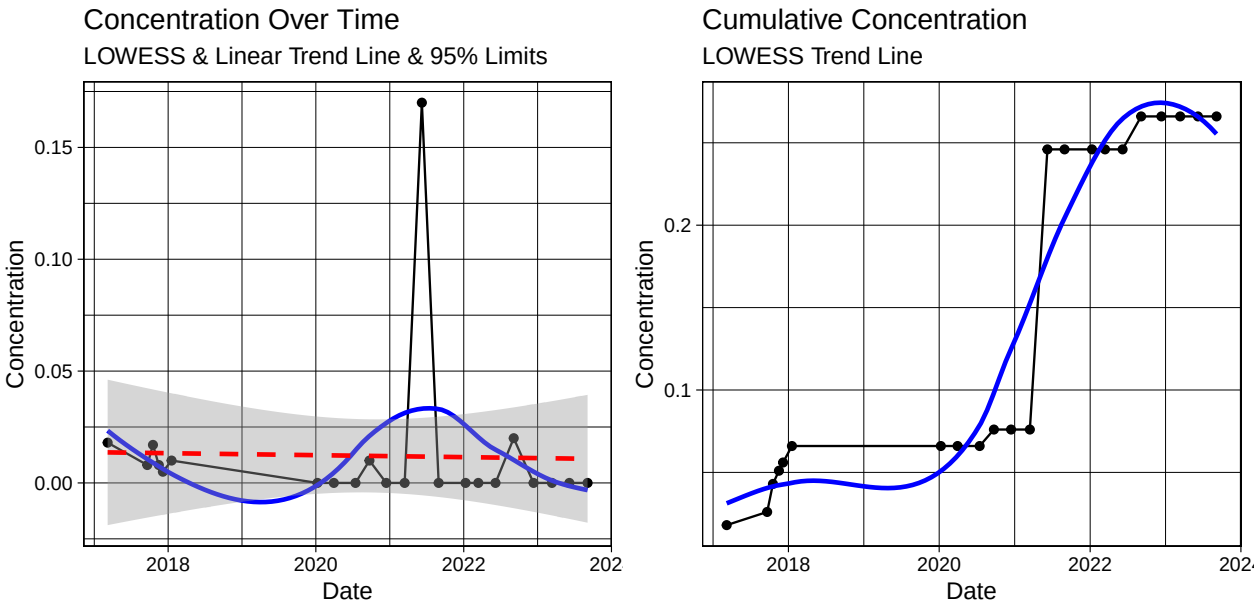
Kendall Trend Test Results Continuous	
n	20
z	-3.74
p	0
S	-116
varS	943.33
tau	-0.62
mean	0.16
sd	0.19
cov	1.17
results	DECREASING

Report for ID : MW123 and Analyte : PFOS



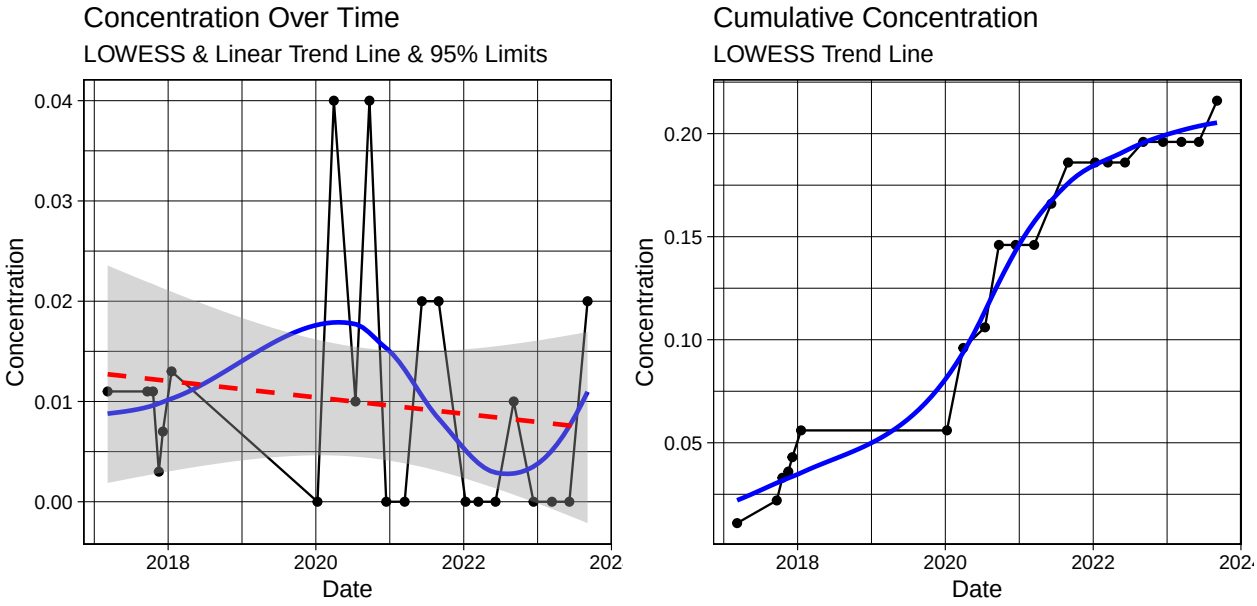
Kendall Trend Test Results Continuous	
n	22
z	-2.36
p	0.02
S	-75
varS	987
tau	-0.4
mean	0.01
sd	0.04
cov	2.97
results	DECREASING

Report for ID : MW124 and Analyte : PFOS



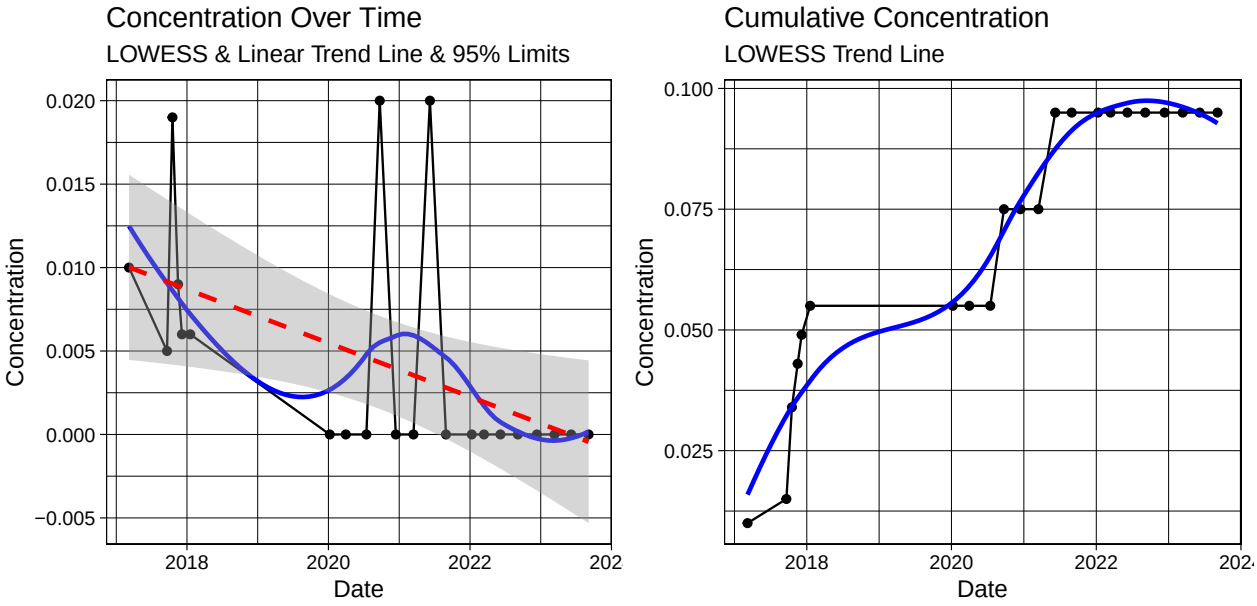
Kendall Trend Test Results Continuous	
n	22
z	-1.41
p	0.16
S	-49
varS	1156.33
tau	-0.24
mean	0.01
sd	0.01
cov	1.23
results	NO CLEAR TREND

Report for ID : MW125 and Analyte : PFOS



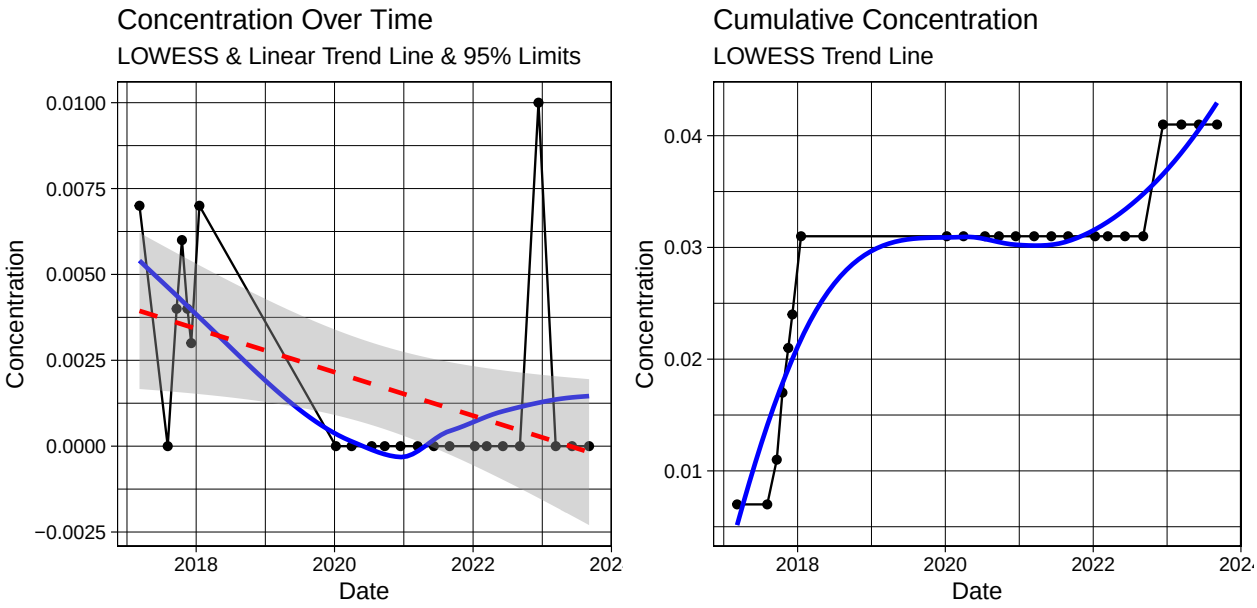
Kendall Trend Test Results Continuous	
n	22
z	-2.87
p	0
S	-88
varS	922
tau	-0.49
mean	0
sd	0.01
cov	1.62
results	DECREASING

Report for ID : MW126 and Analyte : PFOS



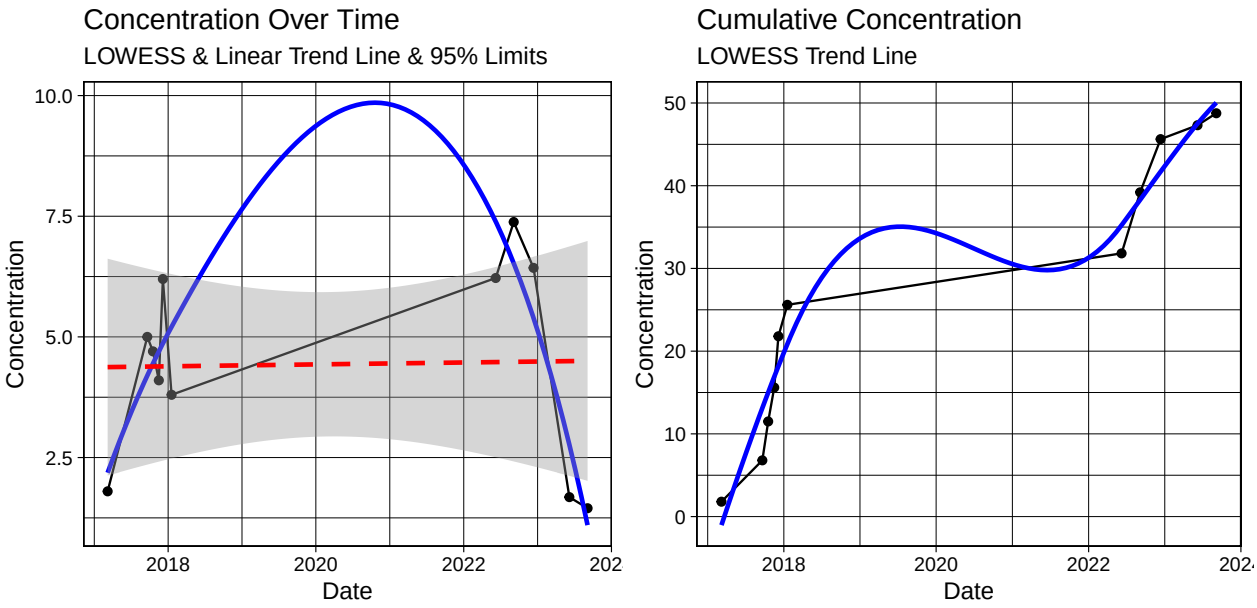
Kendall Trend Test Results Continuous	
n	23
z	-2.35
p	0.02
S	-73
varS	938.33
tau	-0.4
mean	0
sd	0
cov	1.7
results	DECREASING

Report for ID : MW127 and Analyte : PFOS



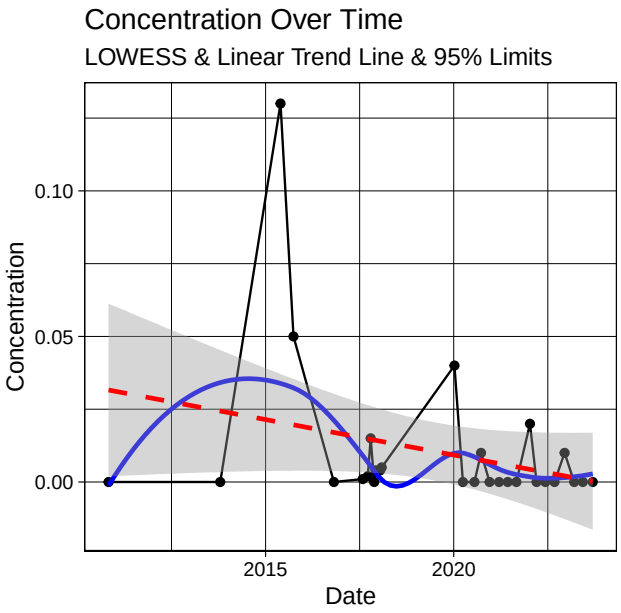
Kendall Trend Test Results Continuous	
n	11
z	0
p	1
S	1
varS	165
tau	0.02
mean	4.43
sd	2.08
cov	0.47
results	NO CLEAR TREND

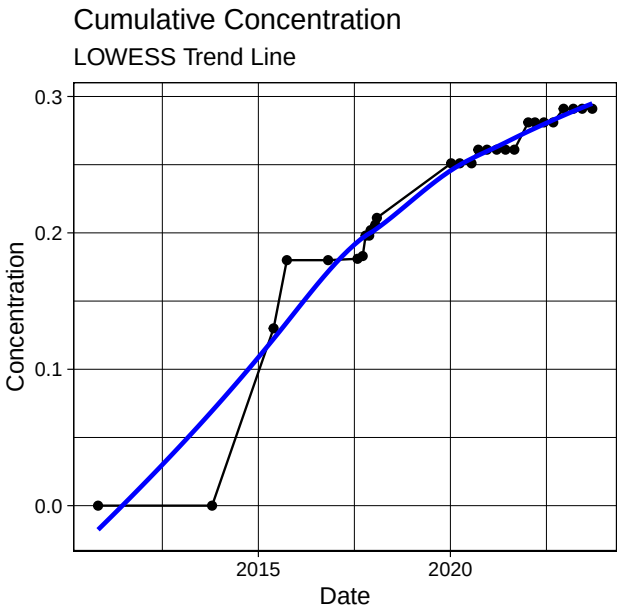
Report for ID : MW128 and Analyte : PFOS



Kendall Trend Test Results Continuous	
n	28
z	-1.56
p	0.12
S	-72
varS	2066.67
tau	-0.23
mean	0.01
sd	0.03
cov	2.54
results	NO CLEAR TREND

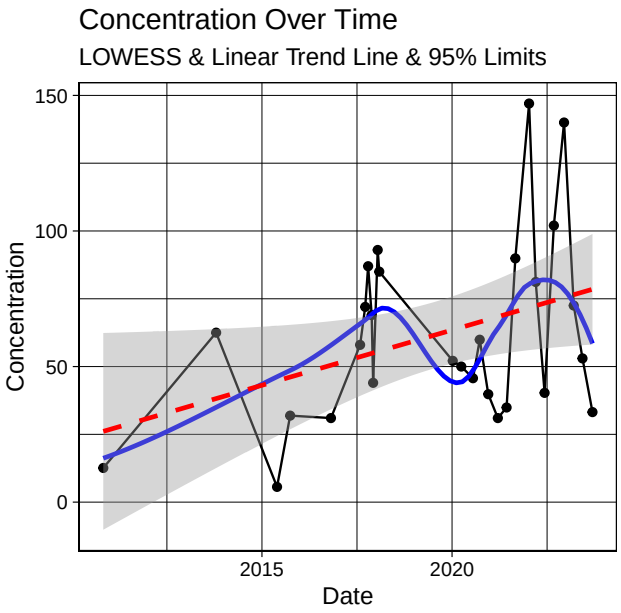
Report for ID : MW139 and Analyte : PFOS

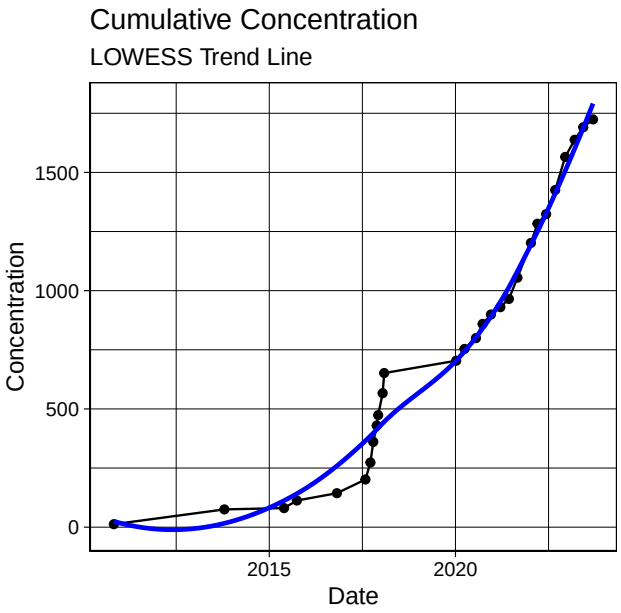




Kendall Trend Test Results Continuous	
n	28
z	1.46
p	0.14
S	75
varS	2561
tau	0.2
mean	61.58
sd	33.52
cov	0.54
results	NO CLEAR TREND

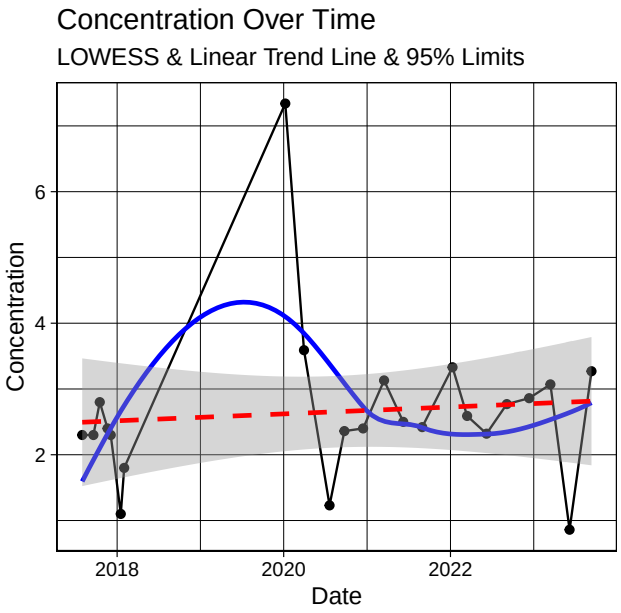
Report for ID : MW141 and Analyte : PFOS

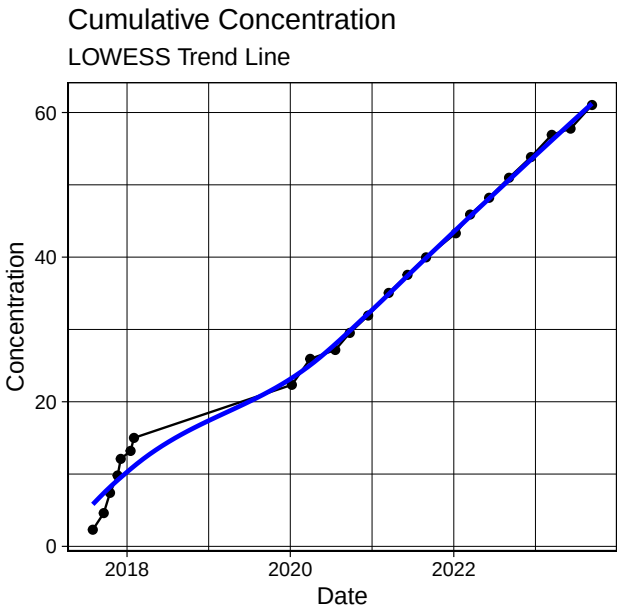




Kendall Trend Test Results Continuous	
n	23
z	1.53
p	0.12
S	59
varS	1429
tau	0.24
mean	2.65
sd	1.23
cov	0.46
results	NO CLEAR TREND

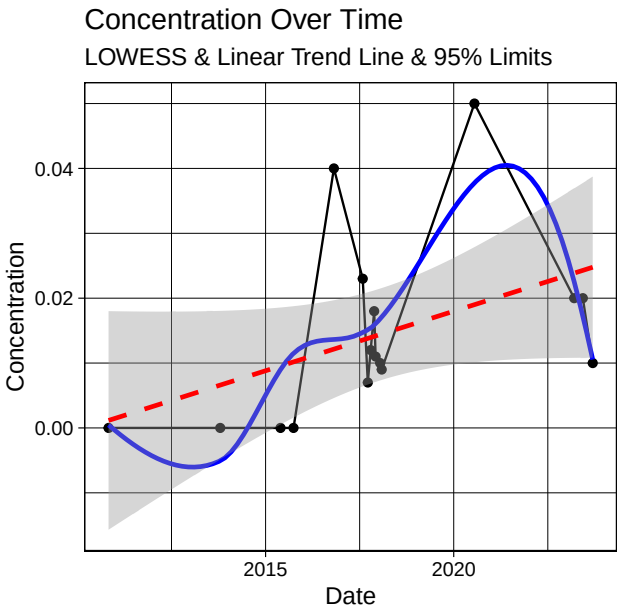
Report for ID : MW142 and Analyte : PFOS

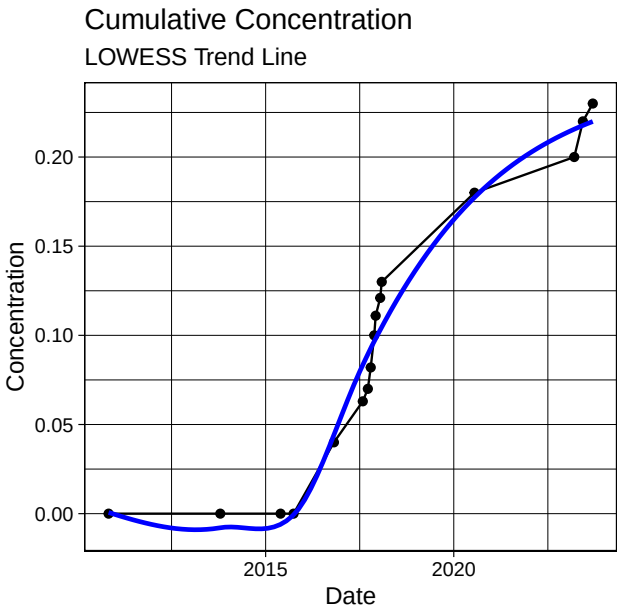




Kendall Trend Test Results Continuous	
n	16
z	1.78
p	0.08
S	40
varS	482.67
tau	0.35
mean	0.01
sd	0.01
cov	0.99
results	POSSIBLY INCREASING

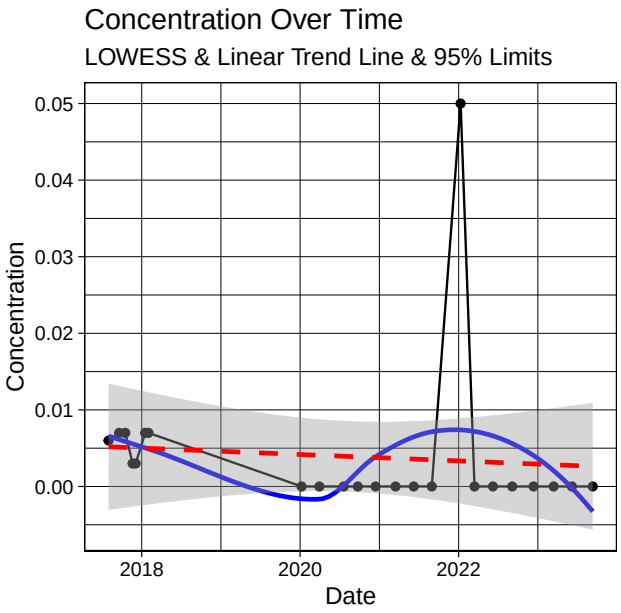
Report for ID : MW147 and Analyte : PFOS

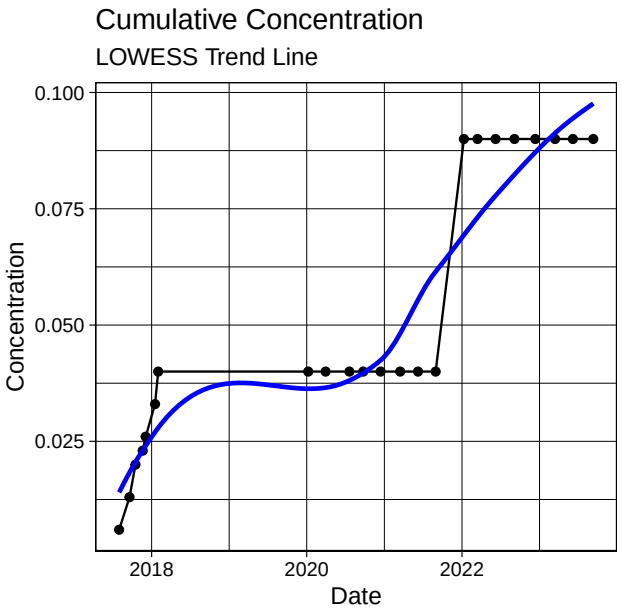




Kendall Trend Test Results Continuous	
n	23
z	-2.95
p	0
S	-95
varS	1015.67
tau	-0.5
mean	0
sd	0.01
cov	2.67
results	DECREASING

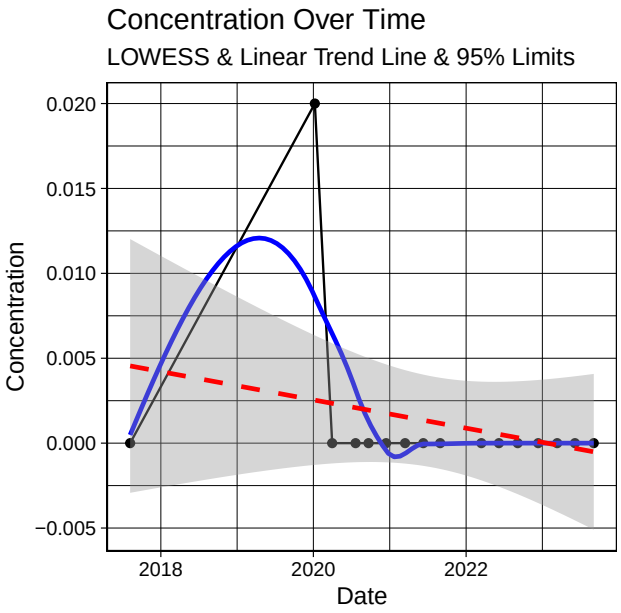
Report for ID : MW149 and Analyte : PFOS

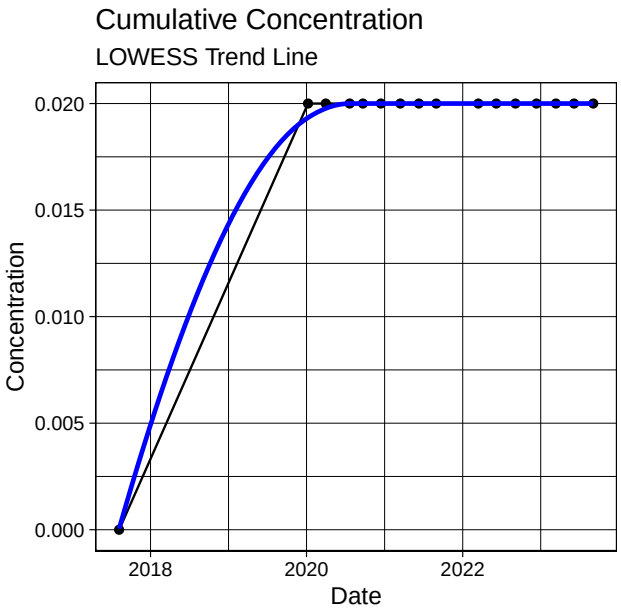




Kendall Trend Test Results Continuous	
n	16
z	-1.3
p	0.19
S	-13
varS	85
tau	-0.31
mean	0
sd	0
cov	4
results	NO CLEAR TREND

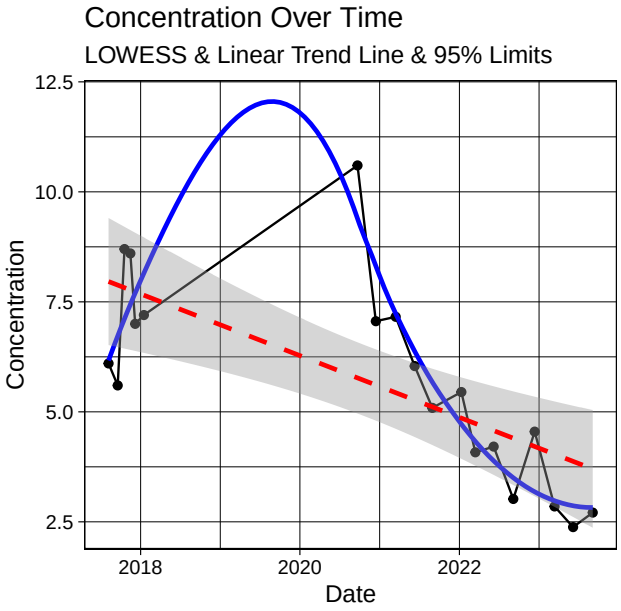
Report for ID : MW158 and Analyte : PFOS

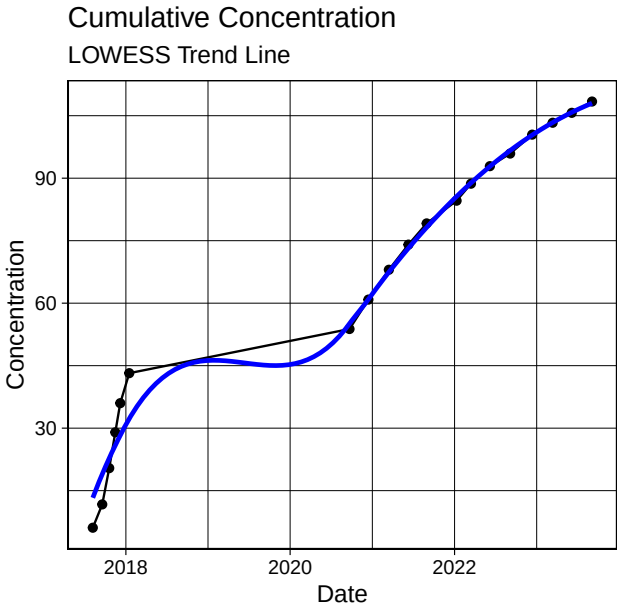




Kendall Trend Test Results Continuous	
n	19
z	-3.92
p	0
S	-113
varS	817
tau	-0.66
mean	5.71
sd	2.25
cov	0.4
results	DECREASING

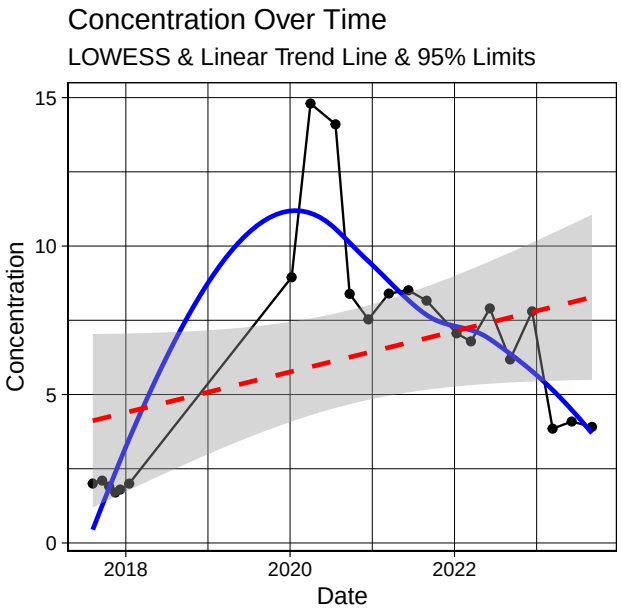
Report for ID : MW161 and Analyte : PFOS

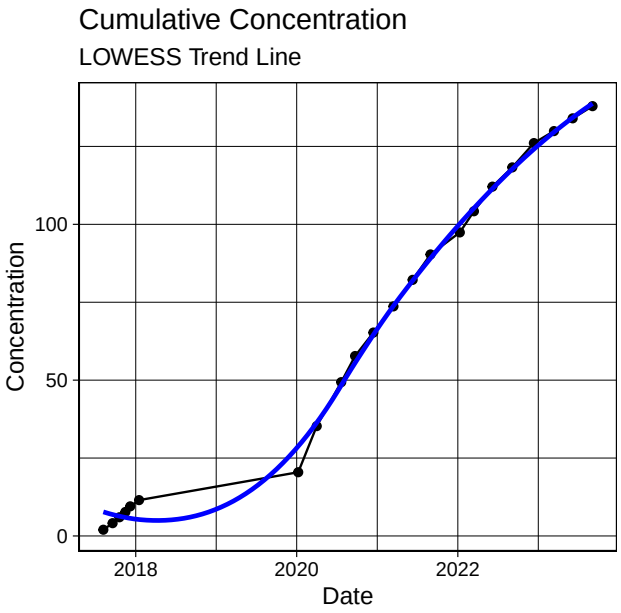




Kendall Trend Test Results Continuous	
n	22
z	0.14
p	0.89
S	6
varS	1256.67
tau	0.03
mean	6.27
sd	3.76
cov	0.6
results	NO CLEAR TREND

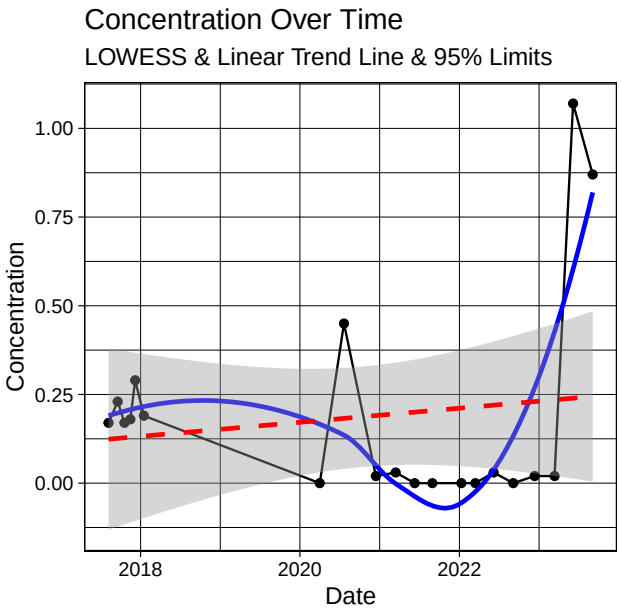
Report for ID : MW166 and Analyte : PFOS

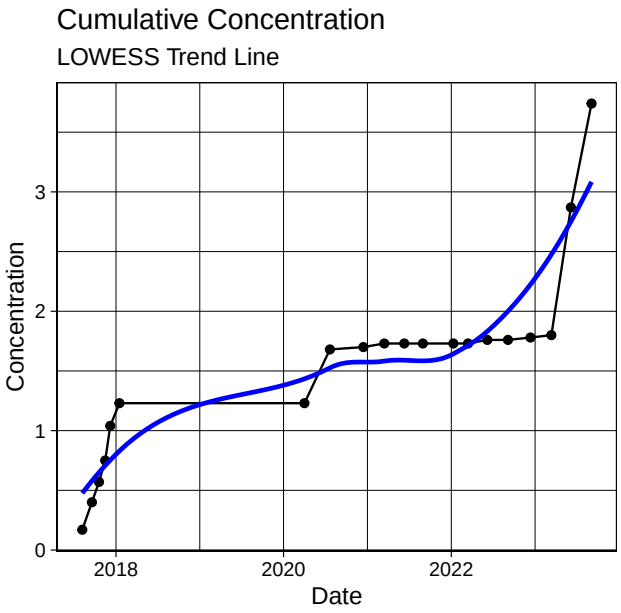




Kendall Trend Test Results Continuous	
n	20
z	-0.69
p	0.49
S	-22
varS	916
tau	-0.12
mean	0.19
sd	0.3
cov	1.59
results	NO CLEAR TREND

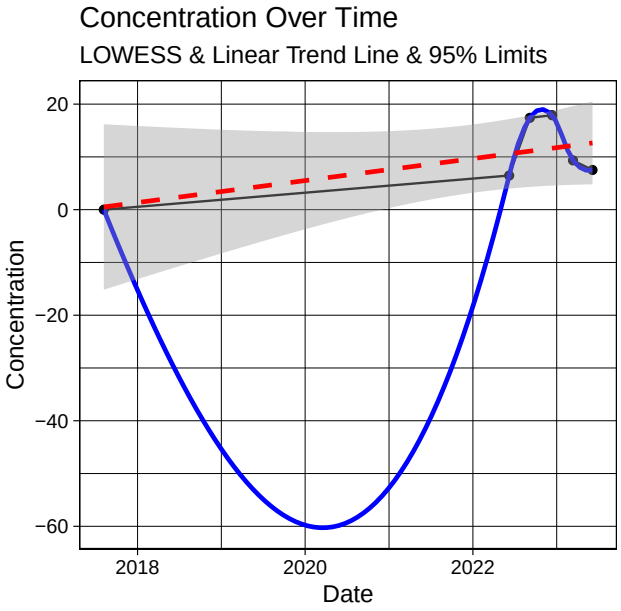
Report for ID : MW171 and Analyte : PFOS

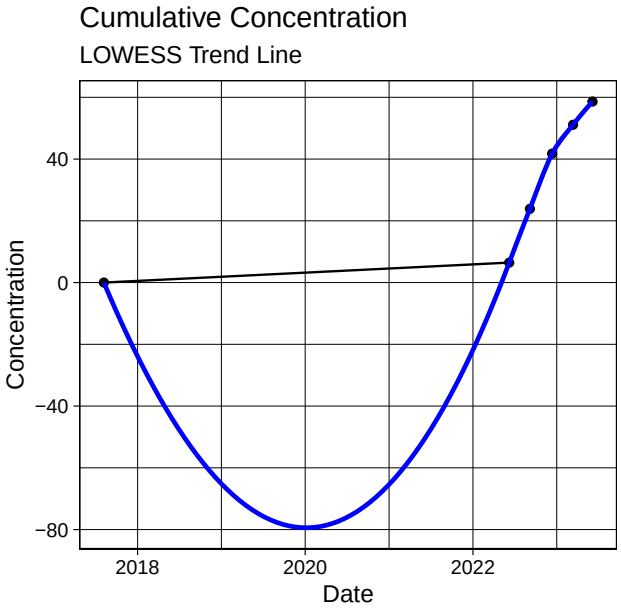




Kendall Trend Test Results Continuous	
n	6
z	0.75
p	0.45
S	5
varS	28.33
tau	0.33
mean	9.77
sd	6.87
cov	0.7
results	NO CLEAR TREND

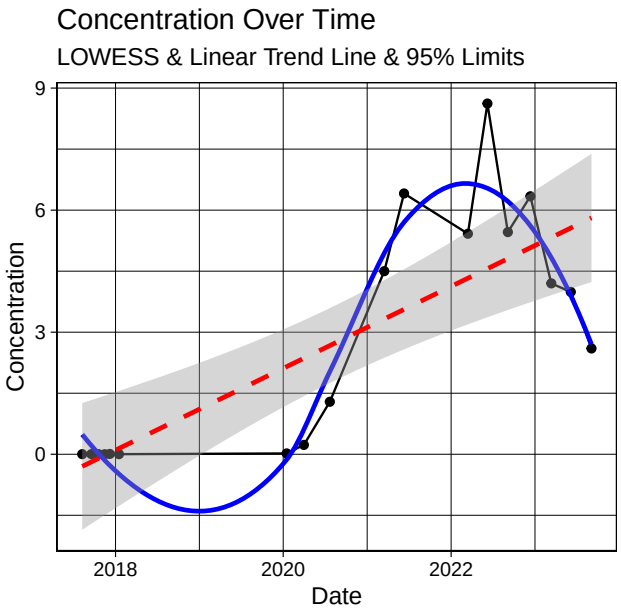
Report for ID : MW172 and Analyte : PFOS

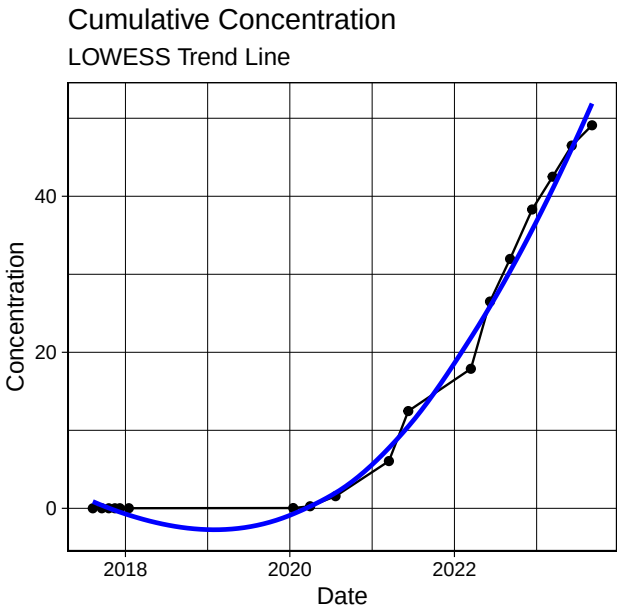




Kendall Trend Test Results Continuous	
n	18
z	3.23
p	0
S	86
varS	693.33
tau	0.57
mean	2.73
sd	2.9
cov	1.06
results	INCREASING

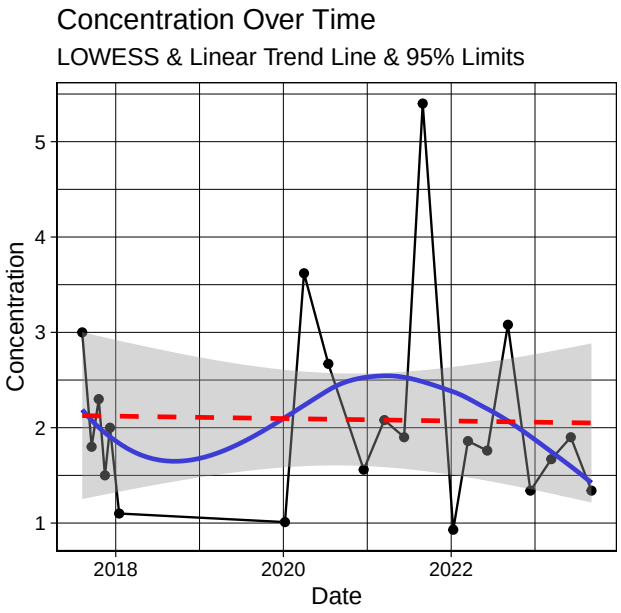
Report for ID : MW173 and Analyte : PFOS

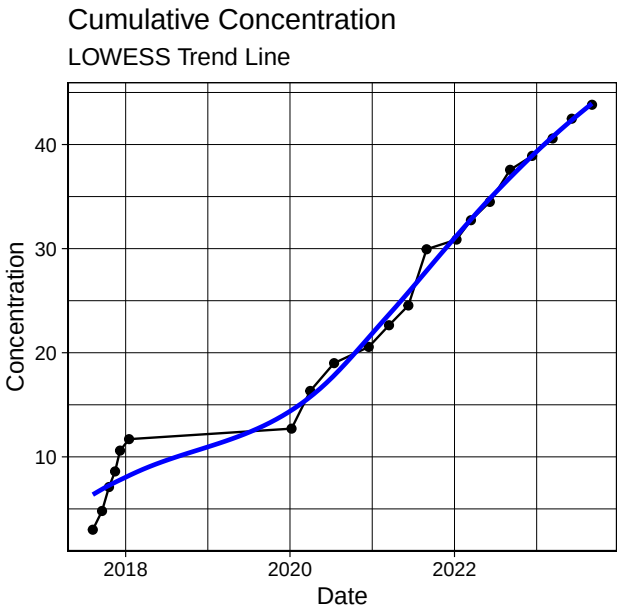




Kendall Trend Test Results Continuous	
n	21
z	-0.88
p	0.38
S	-30
varS	1094.67
tau	-0.14
mean	2.09
sd	1.03
cov	0.49
results	STABLE

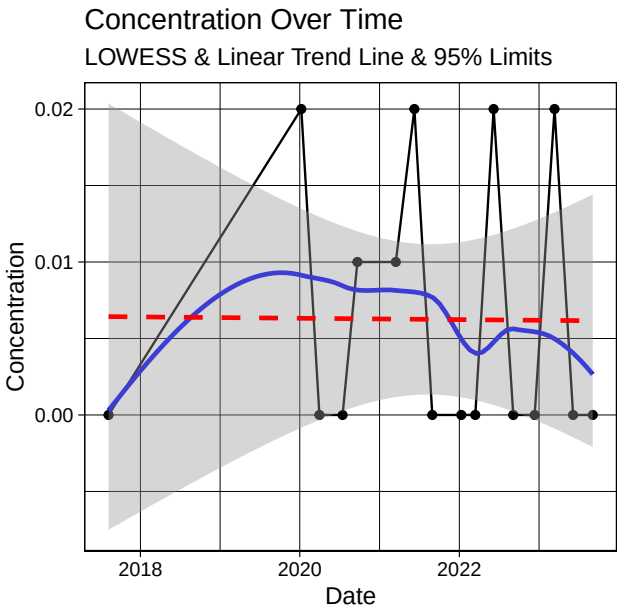
Report for ID : MW193 and Analyte : PFOS

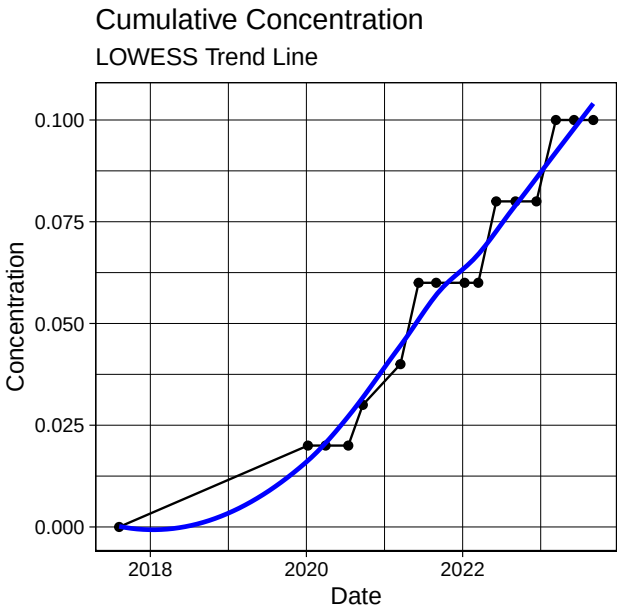




Kendall Trend Test Results Continuous	
n	16
z	-0.37
p	0.71
S	-8
varS	358.67
tau	-0.09
mean	0.01
sd	0.01
cov	1.42
results	NO CLEAR TREND

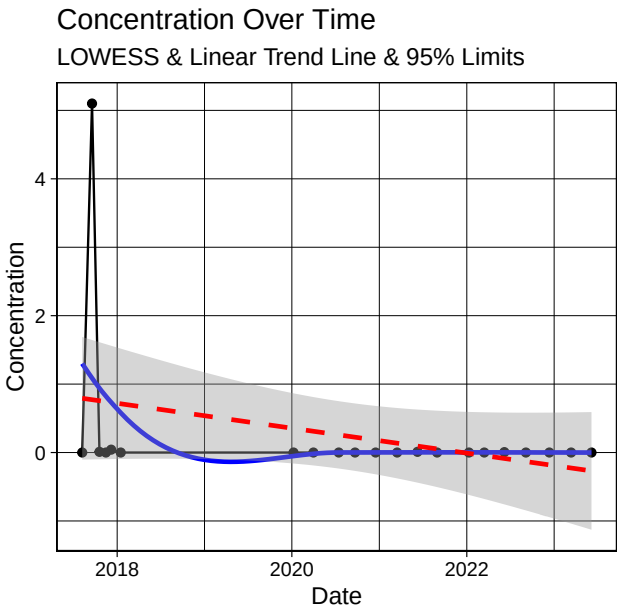
Report for ID : MW195D and Analyte : PFOS

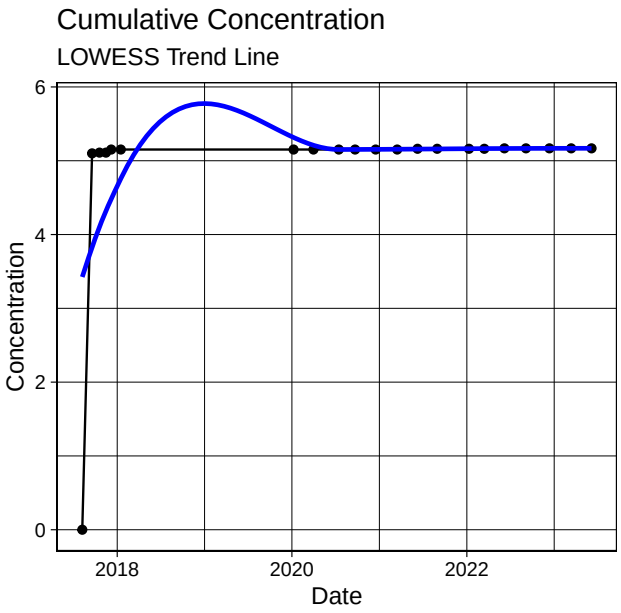




Kendall Trend Test Results Continuous	
n	21
z	-1.47
p	0.14
S	-37
varS	602.33
tau	-0.27
mean	0.25
sd	1.11
cov	4.52
results	NO CLEAR TREND

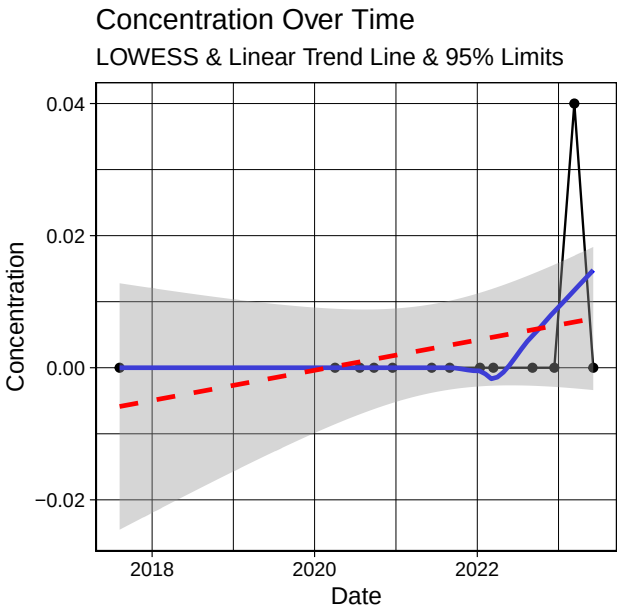
Report for ID : MW195S and Analyte : PFOS

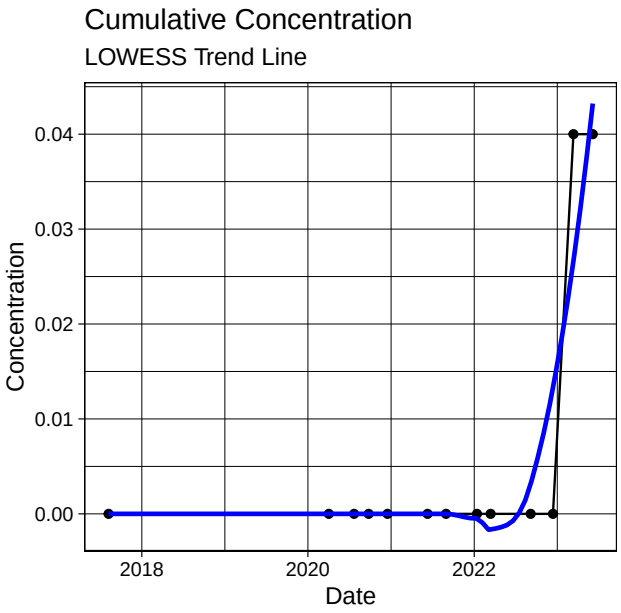




Kendall Trend Test Results Continuous	
n	13
z	1.2
p	0.23
S	10
varS	56
tau	0.33
mean	0
sd	0.01
cov	3.61
results	NO CLEAR TREND

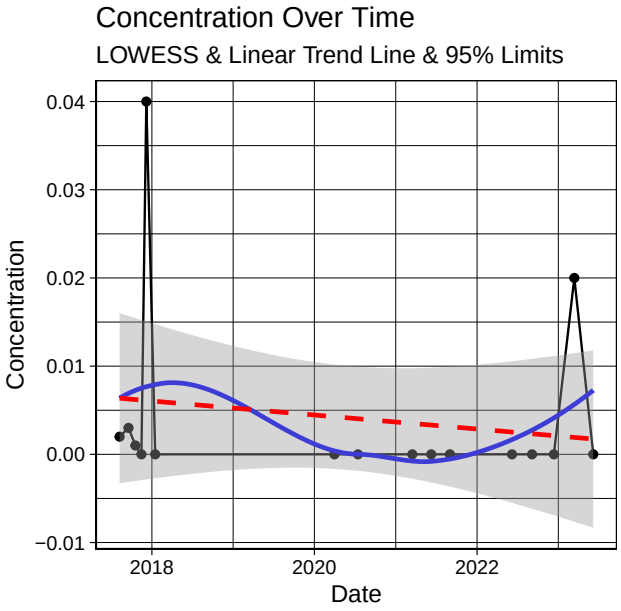
Report for ID : MW196 and Analyte : PFOS

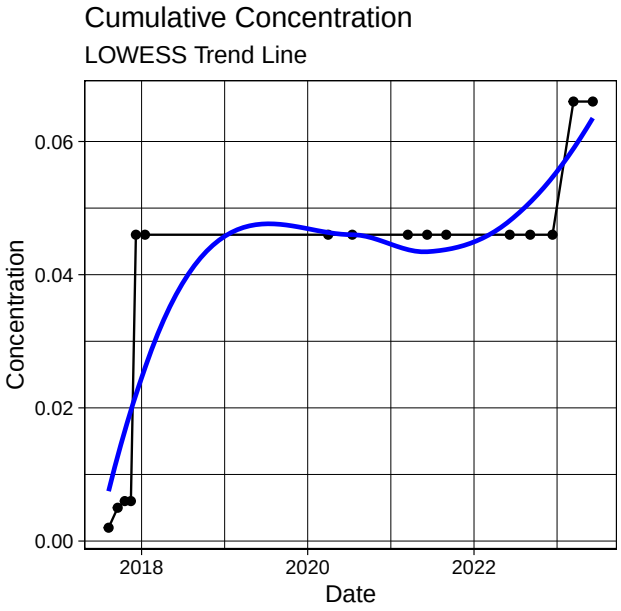




Kendall Trend Test Results Continuous	
n	16
z	-1.55
p	0.12
S	-29
varS	328.33
tau	-0.33
mean	0
sd	0.01
cov	2.61
results	NO CLEAR TREND

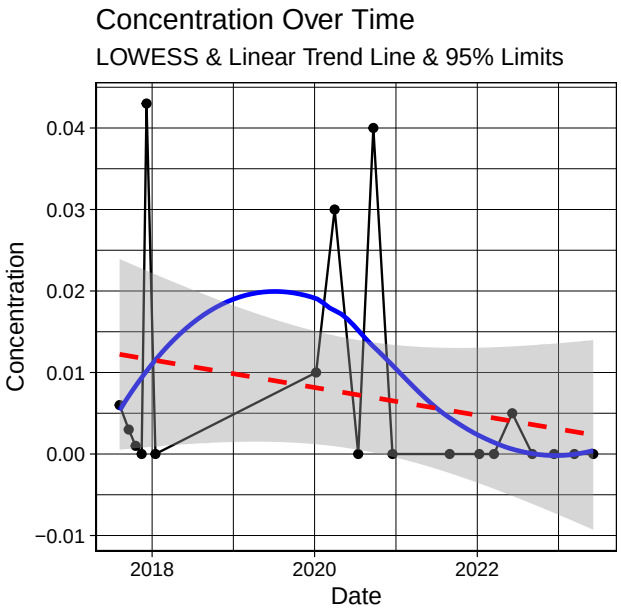
Report for ID : MW197 and Analyte : PFOS

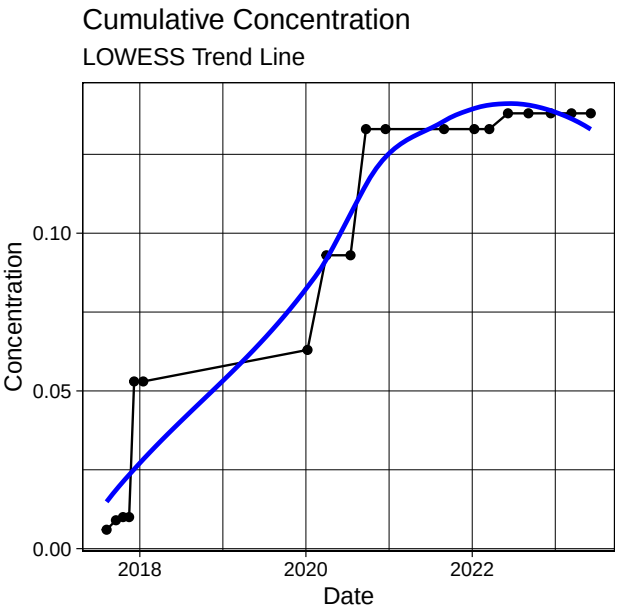




Kendall Trend Test Results Continuous	
n	19
z	-2
p	0.05
S	-52
varS	652
tau	-0.37
mean	0.01
sd	0.01
cov	1.92
results	DECREASING

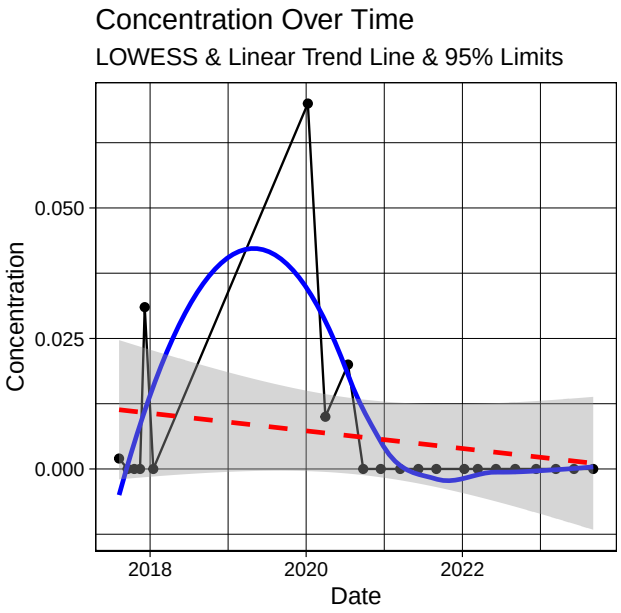
Report for ID : MW199 and Analyte : PFOS

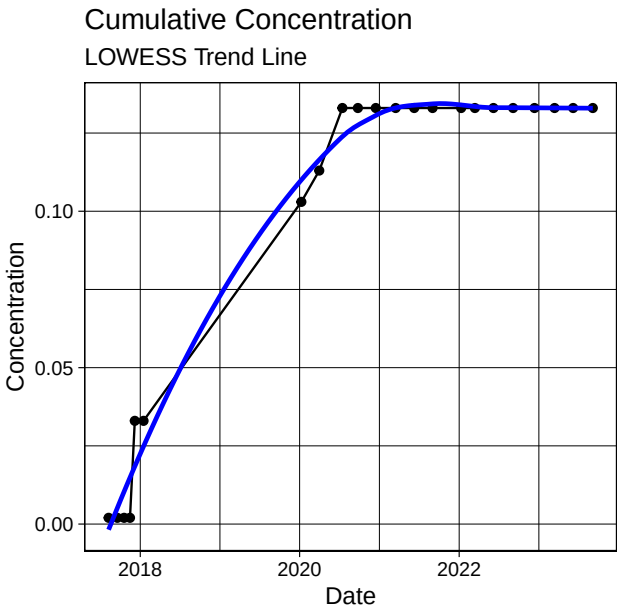




Kendall Trend Test Results Continuous	
n	22
z	-2.01
p	0.04
S	-53
varS	668.33
tau	-0.36
mean	0.01
sd	0.02
cov	2.69
results	DECREASING

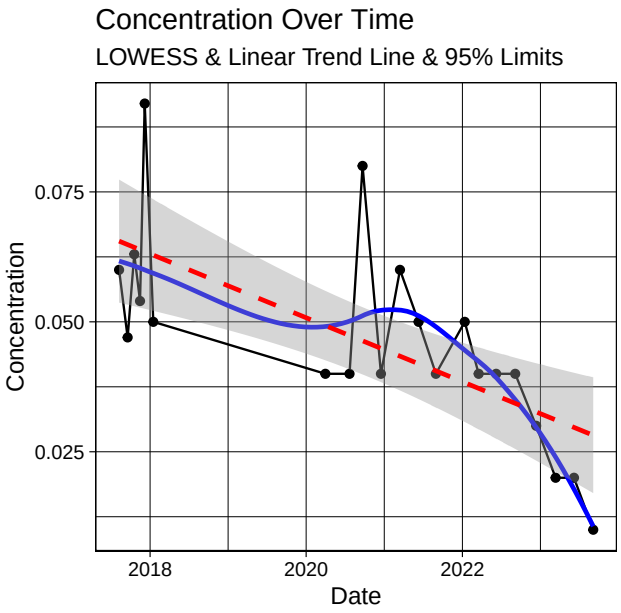
Report for ID : MW200 and Analyte : PFOS

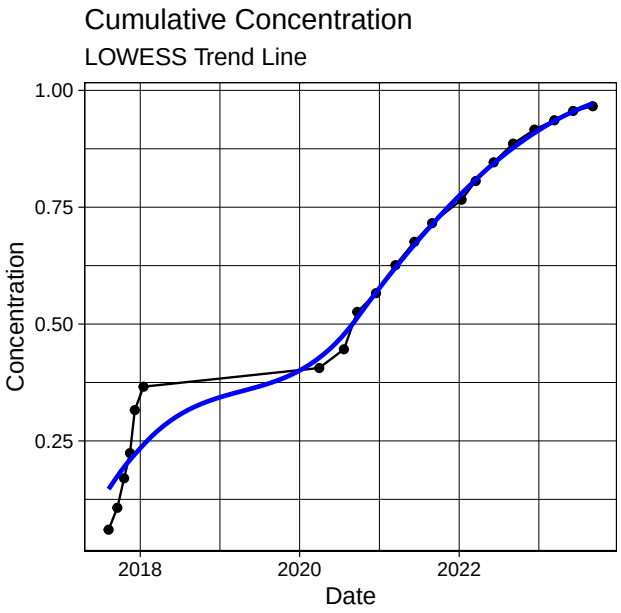




Kendall Trend Test Results Continuous	
n	21
z	-3.8
p	0
S	-124
varS	1046.67
tau	-0.63
mean	0.05
sd	0.02
cov	0.41
results	DECREASING

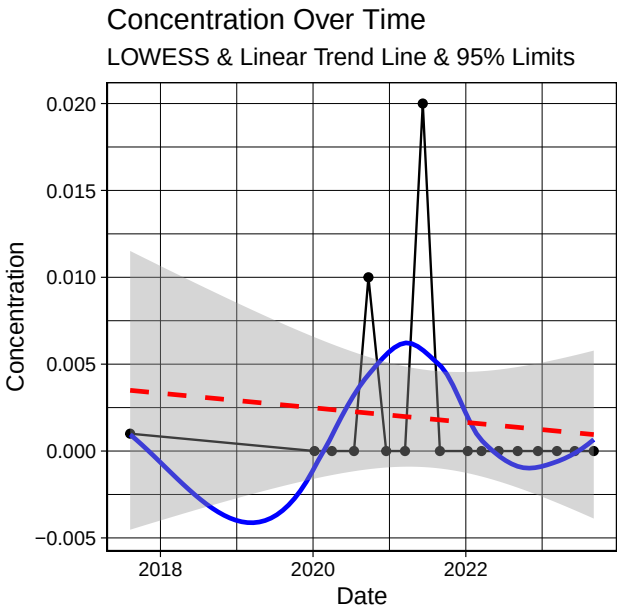
Report for ID : MW202 and Analyte : PFOS

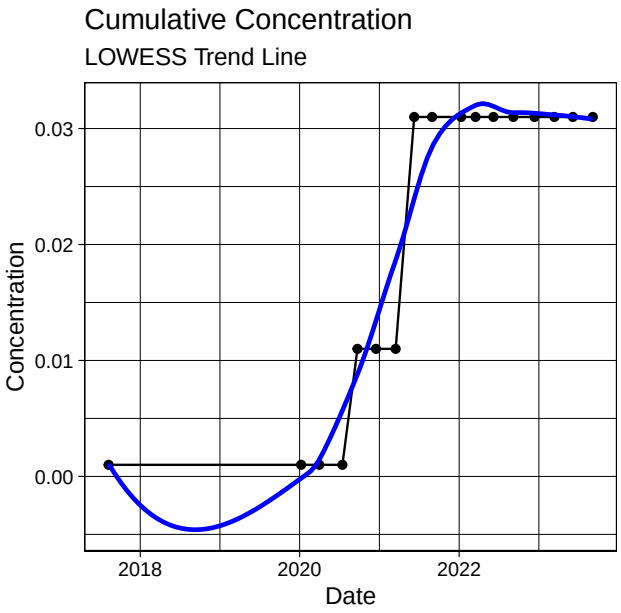




Kendall Trend Test Results Continuous	
n	17
z	-1.38
p	0.17
S	-23
varS	255.67
tau	-0.29
mean	0
sd	0.01
cov	2.89
results	NO CLEAR TREND

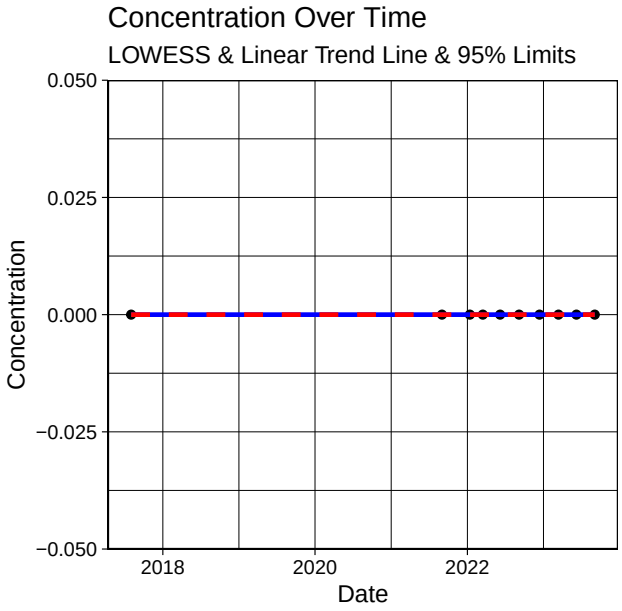
Report for ID : MW203 and Analyte : PFOS

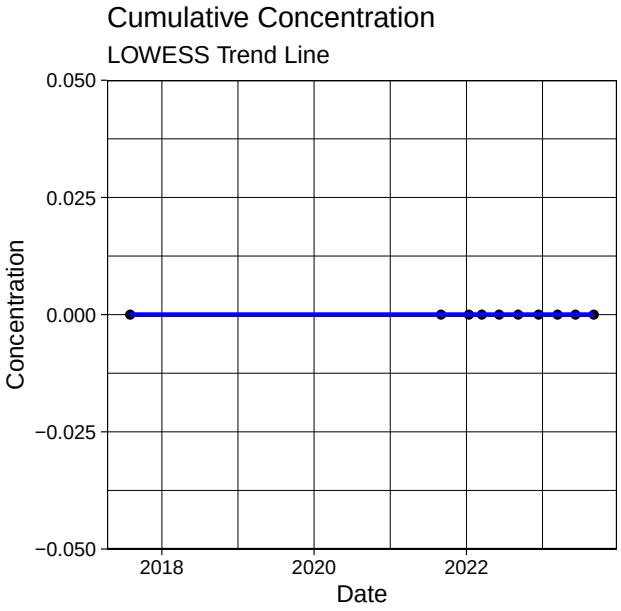




Kendall Trend Test Results Continuous	
n	10
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

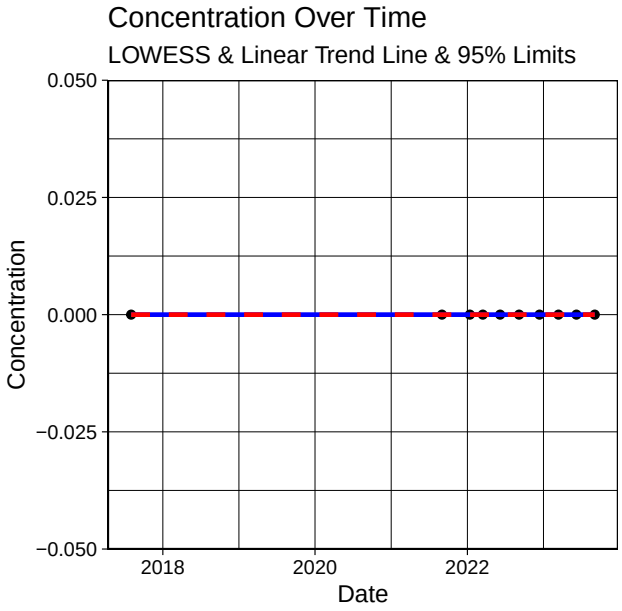
Report for ID : MW214 and Analyte : PFOS

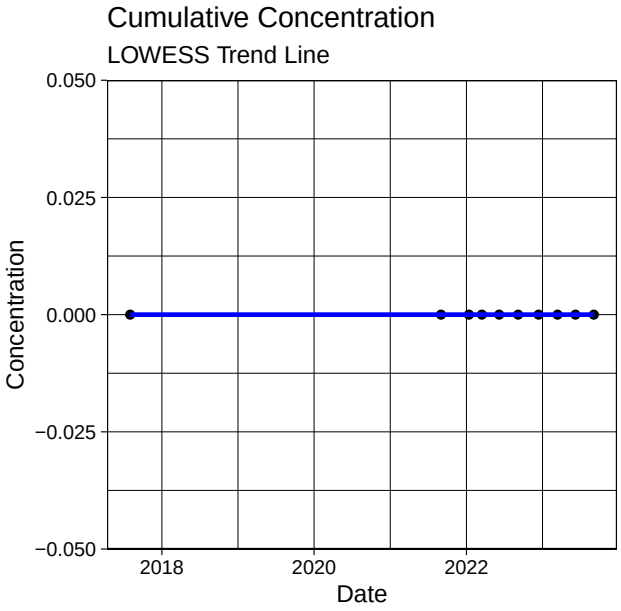




Kendall Trend Test Results Continuous	
n	10
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

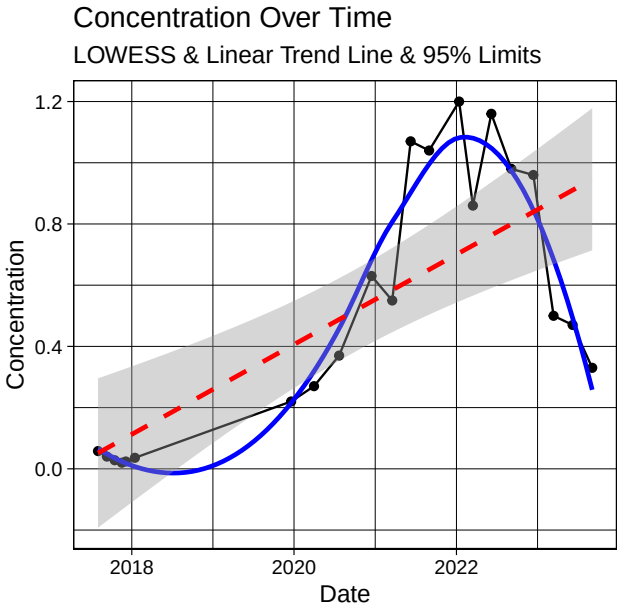
Report for ID : MW215 and Analyte : PFOS

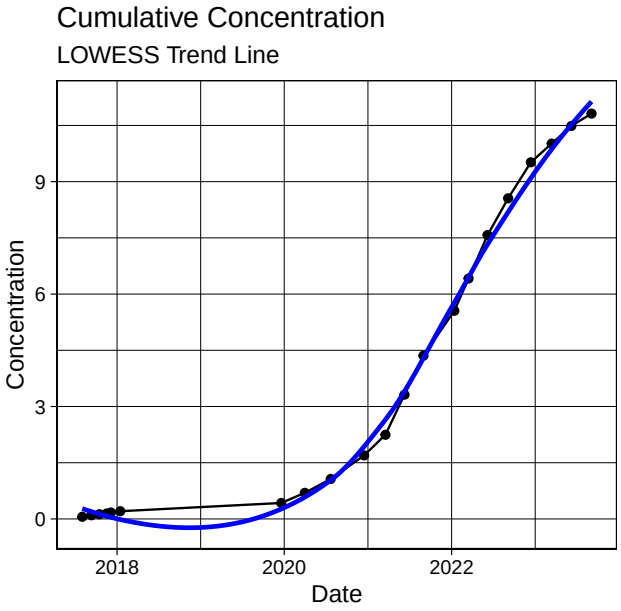




Kendall Trend Test Results Continuous	
n	21
z	2.87
p	0
S	96
varS	1096.67
tau	0.46
mean	0.52
sd	0.42
cov	0.82
results	INCREASING

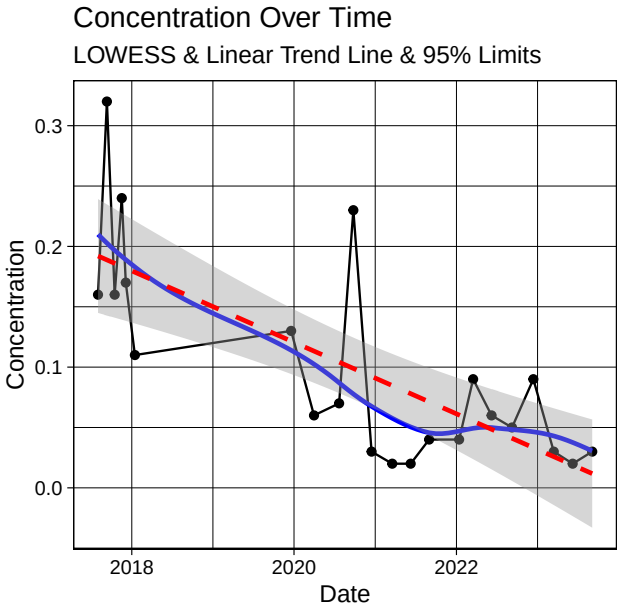
Report for ID : MW216 and Analyte : PFOS

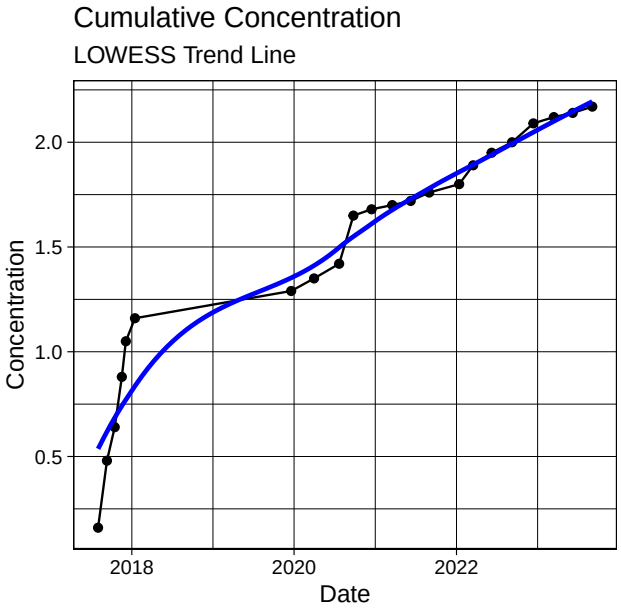




Kendall Trend Test Results Continuous	
n	22
z	-3.34
p	0
S	-119
varS	1246.33
tau	-0.53
mean	0.1
sd	0.08
cov	0.84
results	DECREASING

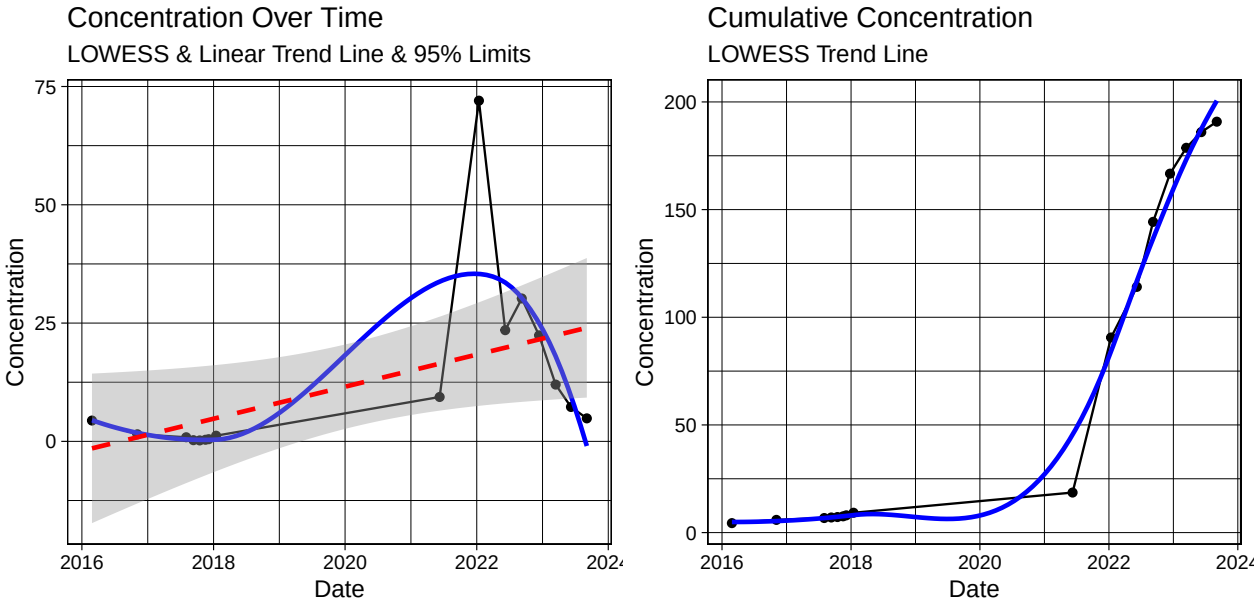
Report for ID : MW217 and Analyte : PFOS





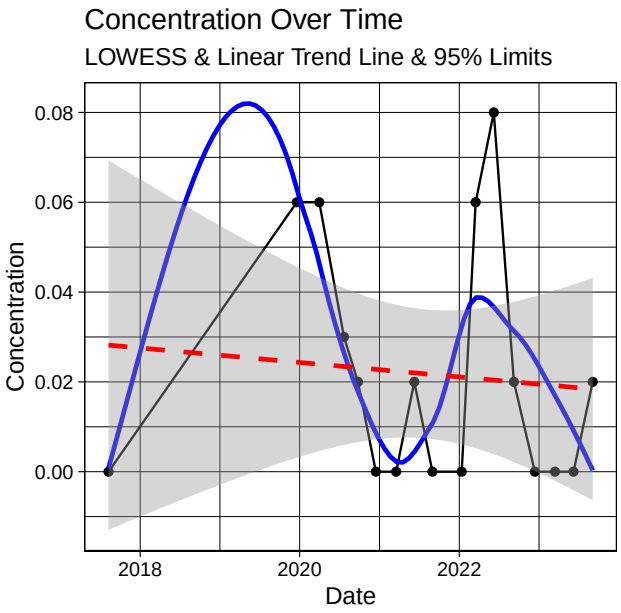
Kendall Trend Test Results Continuous	
n	16
z	1.76
p	0.08
S	40
varS	493.33
tau	0.33
mean	11.93
sd	18.63
cov	1.56
results	POSSIBLY INCREASING

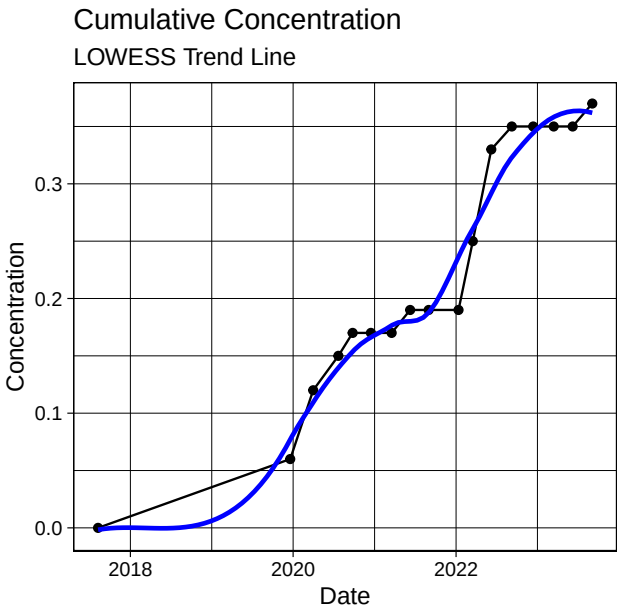
Report for ID : MW220 and Analyte : PFOS



Kendall Trend Test Results Continuous	
n	17
z	-0.88
p	0.38
S	-21
varS	511.67
tau	-0.18
mean	0.02
sd	0.03
cov	1.24
results	NO CLEAR TREND

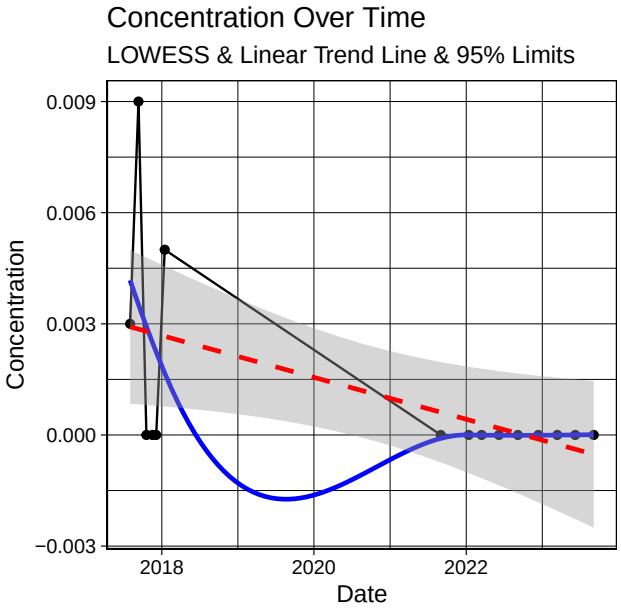
Report for ID : MW224 and Analyte : PFOS

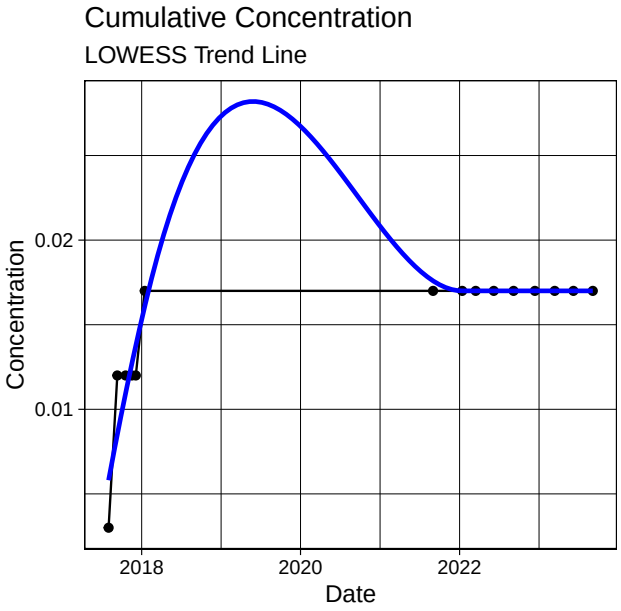




Kendall Trend Test Results Continuous	
n	15
z	-2
p	0.05
S	-29
varS	195.67
tau	-0.45
mean	0
sd	0
cov	2.31
results	DECREASING

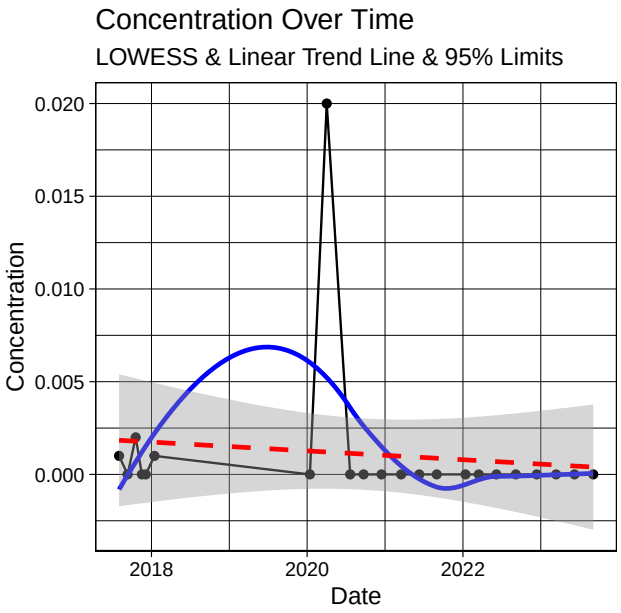
Report for ID : MW225 and Analyte : PFOS

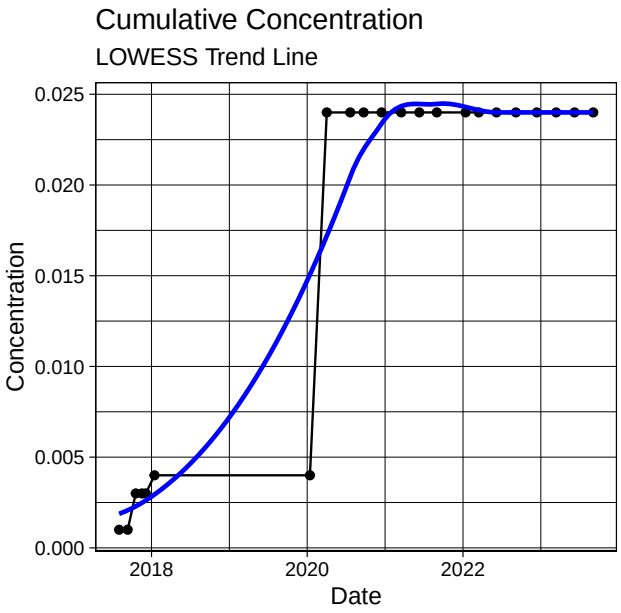




Kendall Trend Test Results Continuous	
n	22
z	-2.2
p	0.03
S	-53
varS	559.67
tau	-0.4
mean	0
sd	0
cov	3.9
results	DECREASING

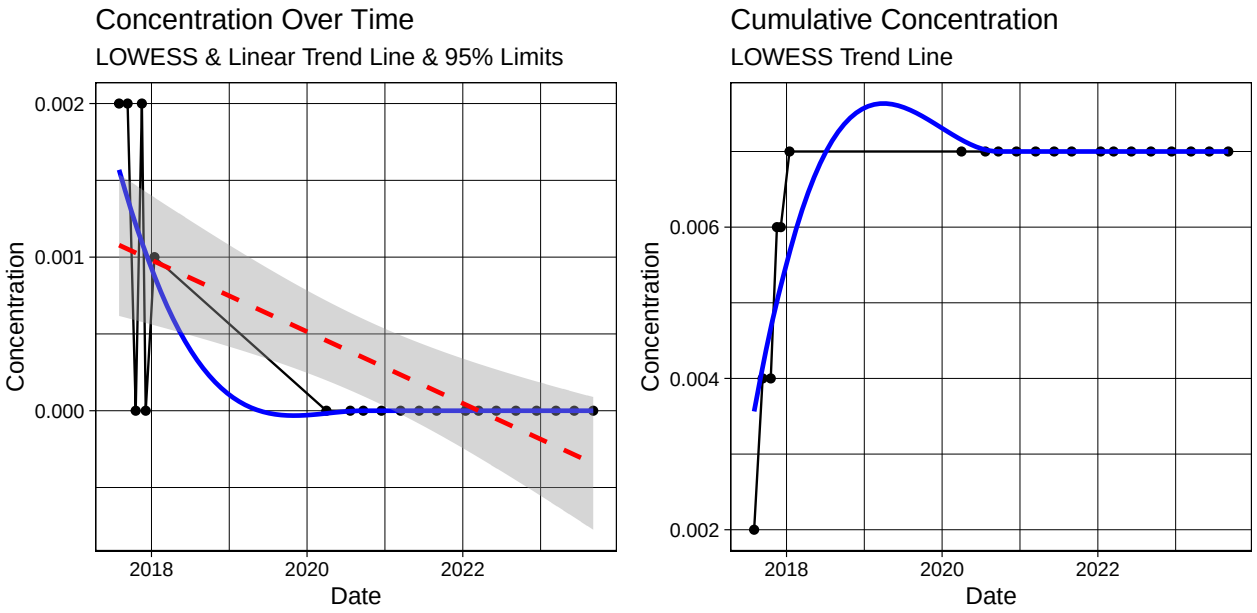
Report for ID : MW226 and Analyte : PFOS





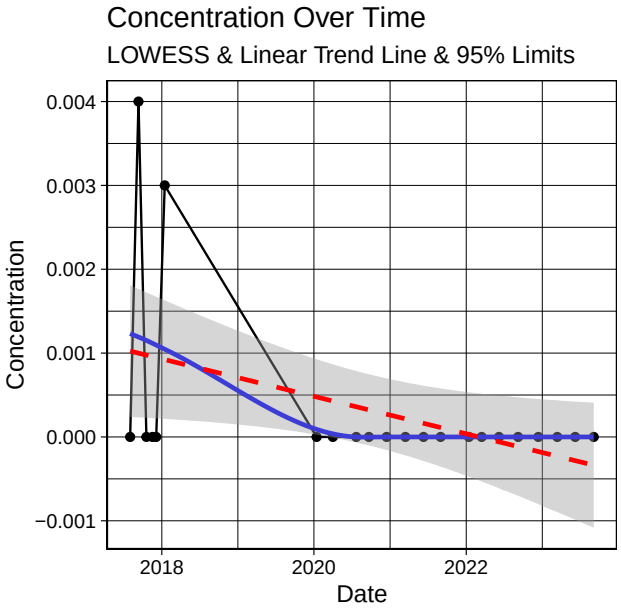
Kendall Trend Test Results Continuous	
n	21
z	-2.85
p	0
S	-65
varS	503.67
tau	-0.53
mean	0
sd	0
cov	2.19
results	DECREASING

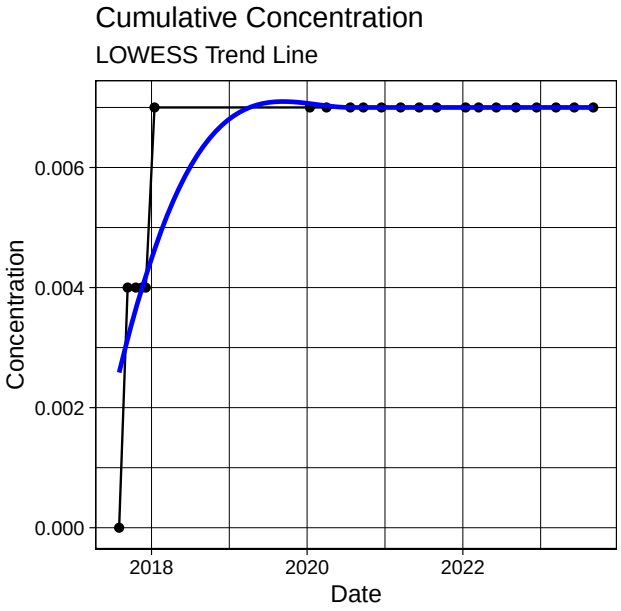
Report for ID : MW227 and Analyte : PFOS



Kendall Trend Test Results Continuous	
n	22
z	-1.71
p	0.09
S	-31
varS	307.67
tau	-0.32
mean	0
sd	0
cov	3.27
results	POSSIBLY DECREASING

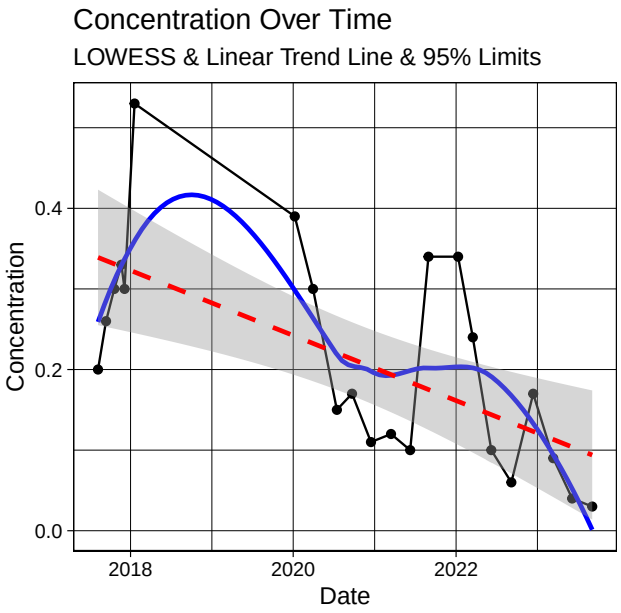
Report for ID : MW228 and Analyte : PFOS

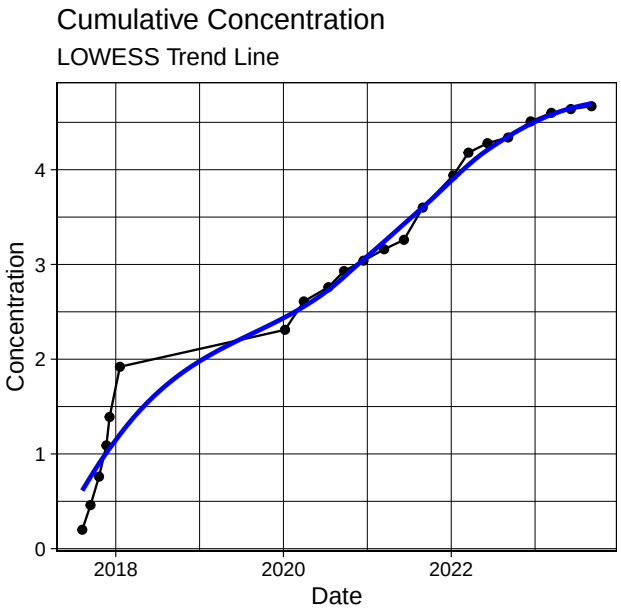




Kendall Trend Test Results Continuous	
n	22
z	-3.11
p	0
S	-111
varS	1251
tau	-0.49
mean	0.21
sd	0.13
cov	0.62
results	DECREASING

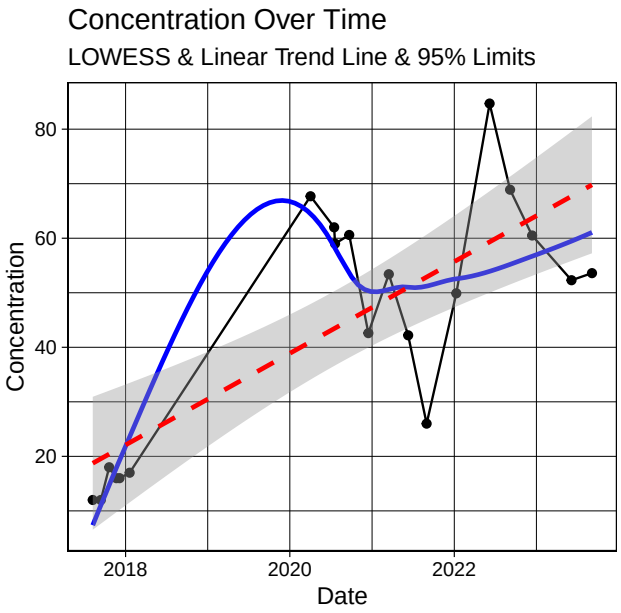
Report for ID : MW233 and Analyte : PFOS

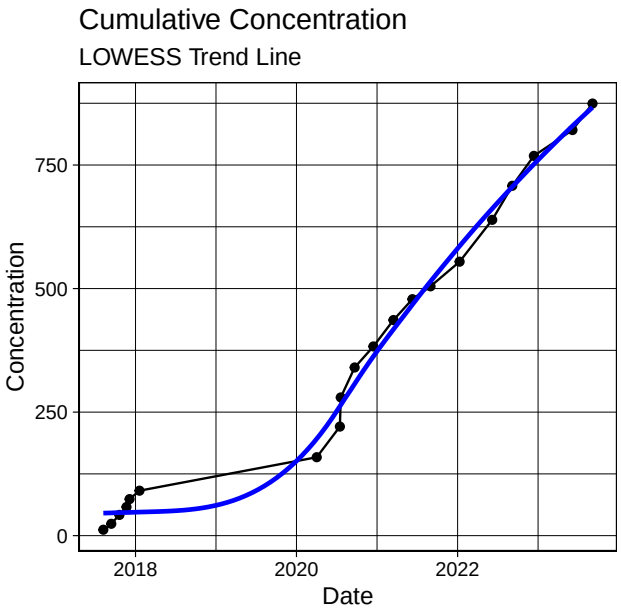




Kendall Trend Test Results Continuous	
n	20
z	2.5
p	0.01
S	78
varS	948
tau	0.41
mean	43.72
sd	22.44
cov	0.51
results	INCREASING

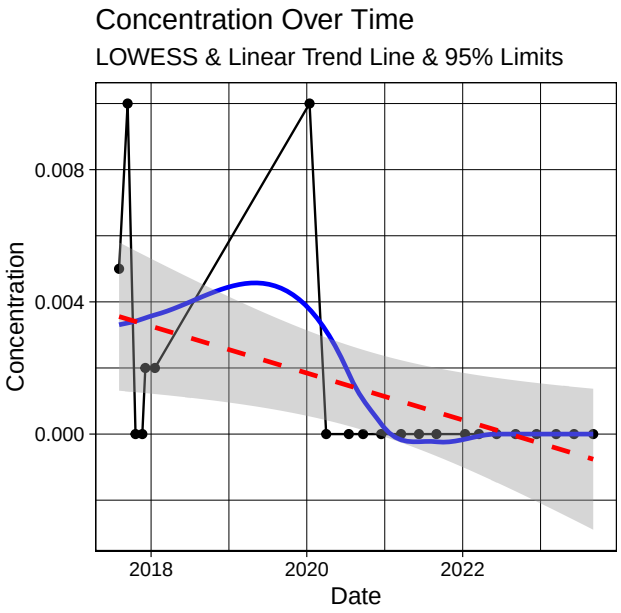
Report for ID : MW236 and Analyte : PFOS

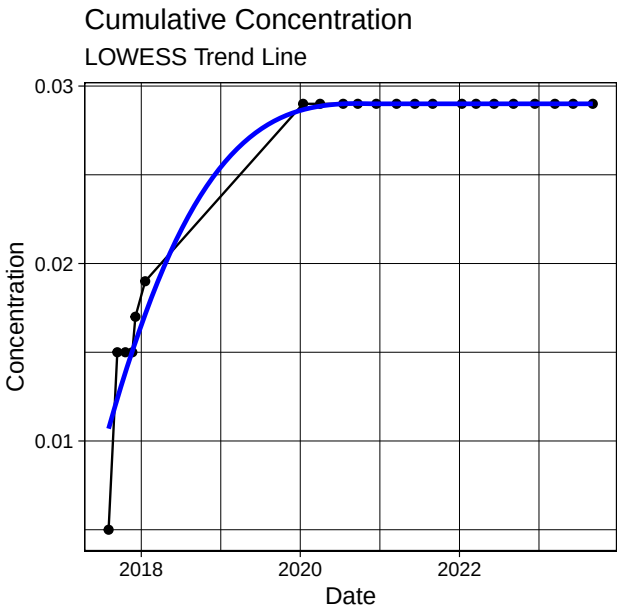




Kendall Trend Test Results Continuous	
n	22
z	-2.79
p	0.01
S	-73
varS	666.33
tau	-0.5
mean	0
sd	0
cov	2.31
results	DECREASING

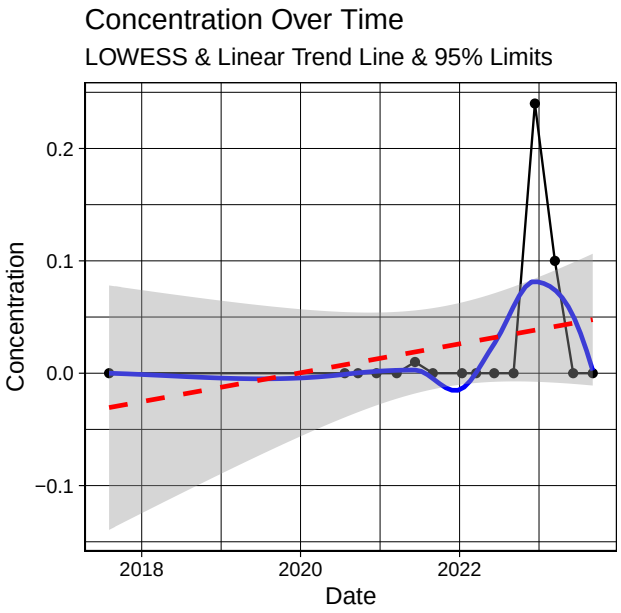
Report for ID : MW238 and Analyte : PFOS

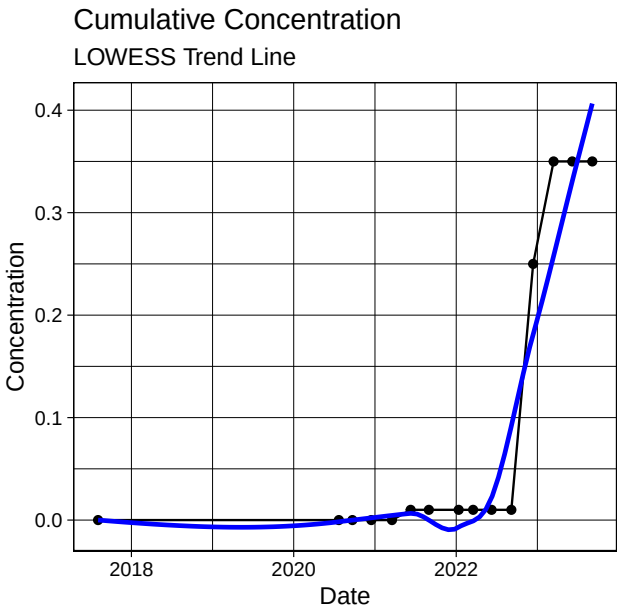




Kendall Trend Test Results Continuous	
n	15
z	1
p	0.32
S	15
varS	195.67
tau	0.23
mean	0.02
sd	0.07
cov	2.79
results	NO CLEAR TREND

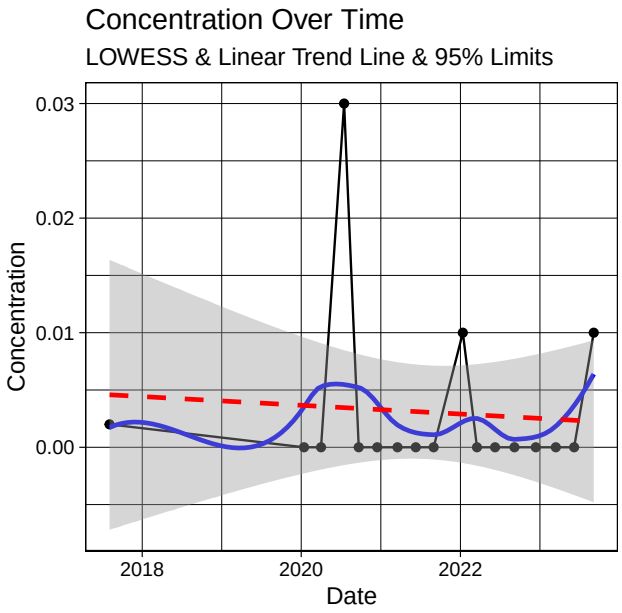
Report for ID : MW239 and Analyte : PFOS

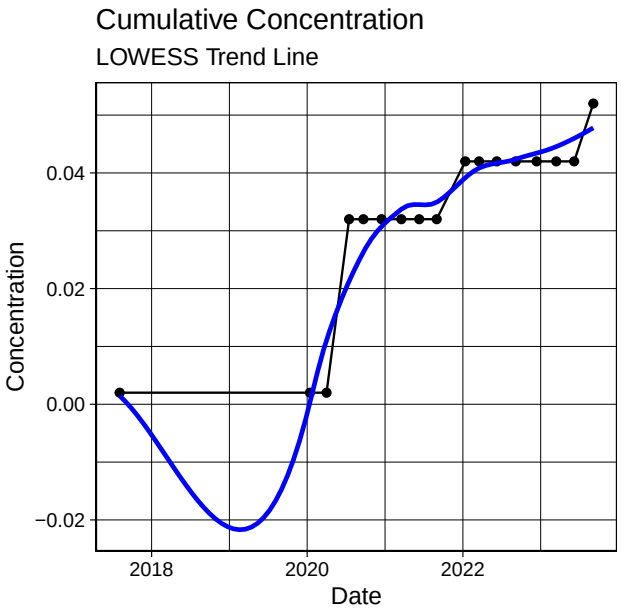




Kendall Trend Test Results Continuous	
n	17
z	-0.34
p	0.74
S	-7
varS	319.67
tau	-0.08
mean	0
sd	0.01
cov	2.51
results	NO CLEAR TREND

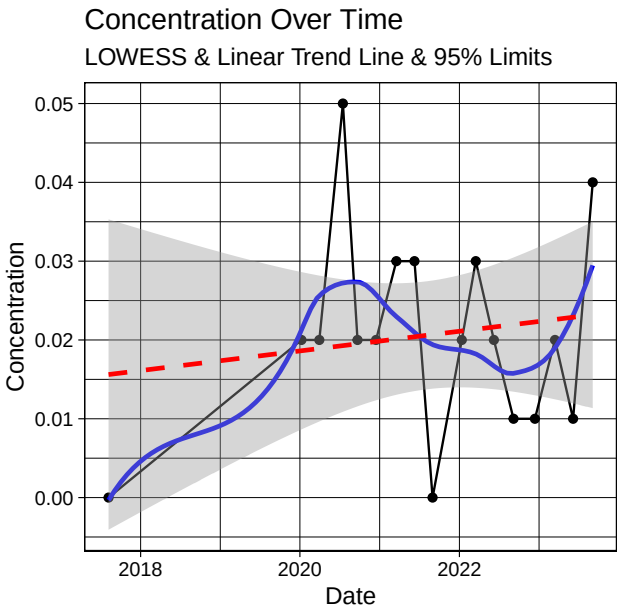
Report for ID : MW240 and Analyte : PFOS

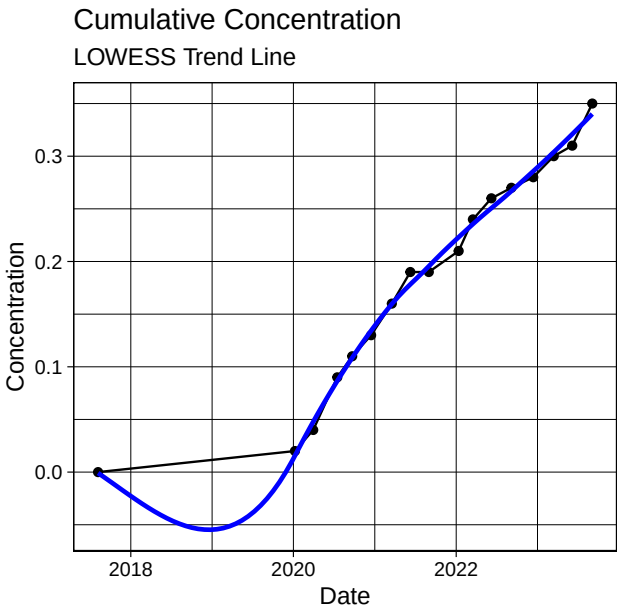




Kendall Trend Test Results Continuous	
n	17
z	-0.04
p	0.97
S	-2
varS	536.67
tau	-0.02
mean	0.02
sd	0.01
cov	0.63
results	STABLE

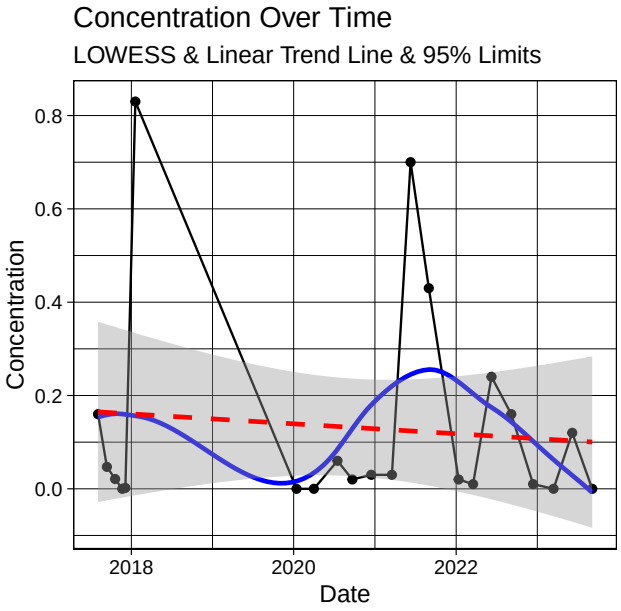
Report for ID : MW242 and Analyte : PFOS

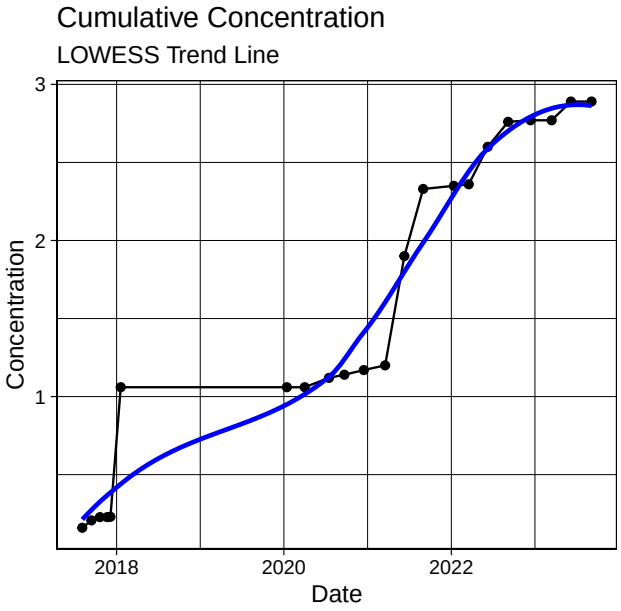




Kendall Trend Test Results Continuous	
n	22
z	-0.4
p	0.69
S	-15
varS	1237
tau	-0.07
mean	0.13
sd	0.23
cov	1.76
results	NO CLEAR TREND

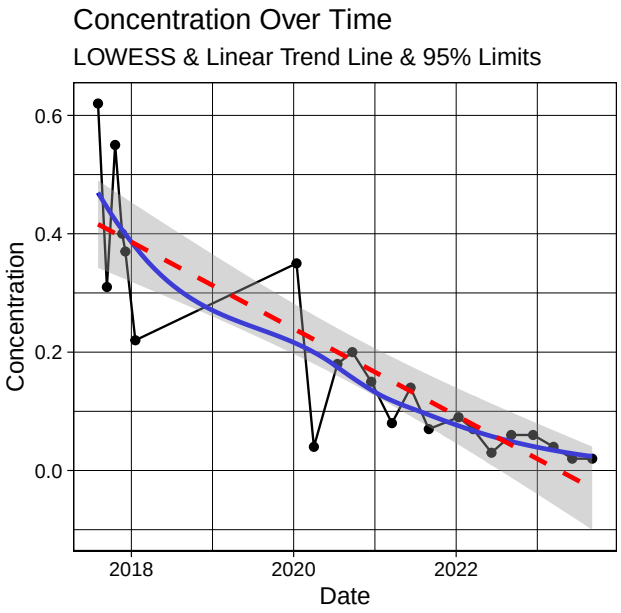
Report for ID : MW243 and Analyte : PFOS

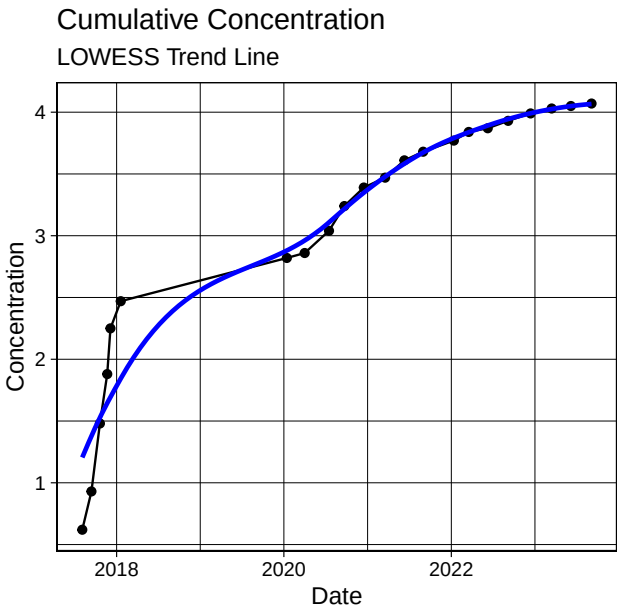




Kendall Trend Test Results Continuous	
n	22
z	-5.14
p	0
S	-183
varS	1253.67
tau	-0.8
mean	0.18
sd	0.18
cov	0.95
results	DECREASING

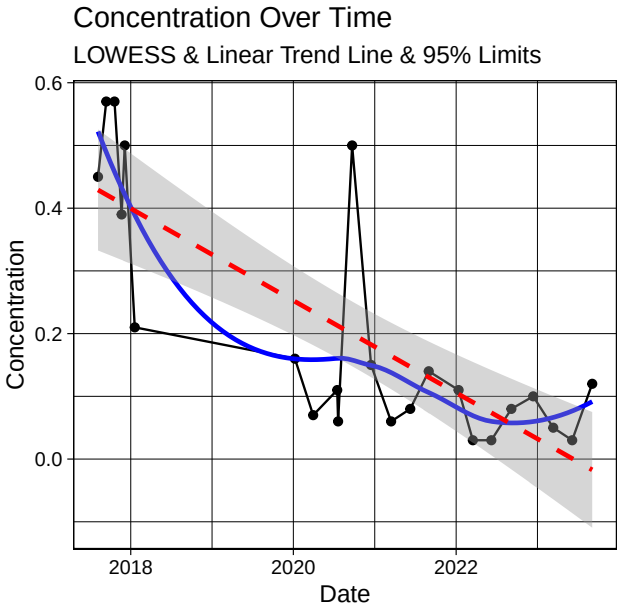
Report for ID : MW245 and Analyte : PFOS

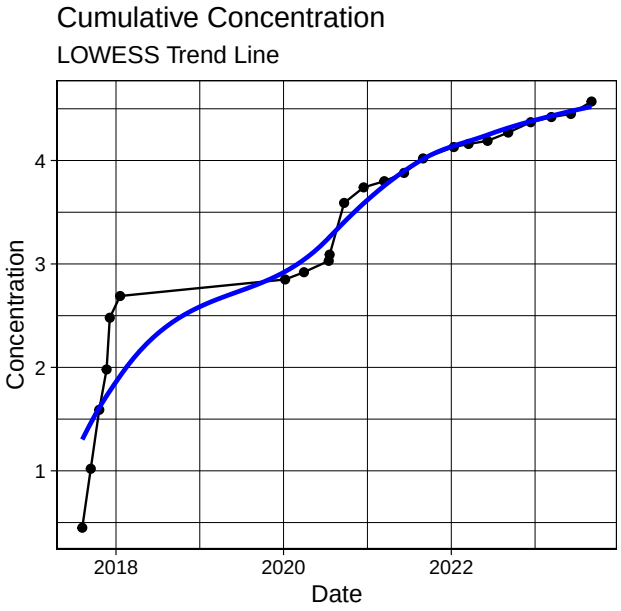




Kendall Trend Test Results Continuous	
n	23
z	-3.66
p	0
S	-139
varS	1425
tau	-0.56
mean	0.2
sd	0.19
cov	0.95
results	DECREASING

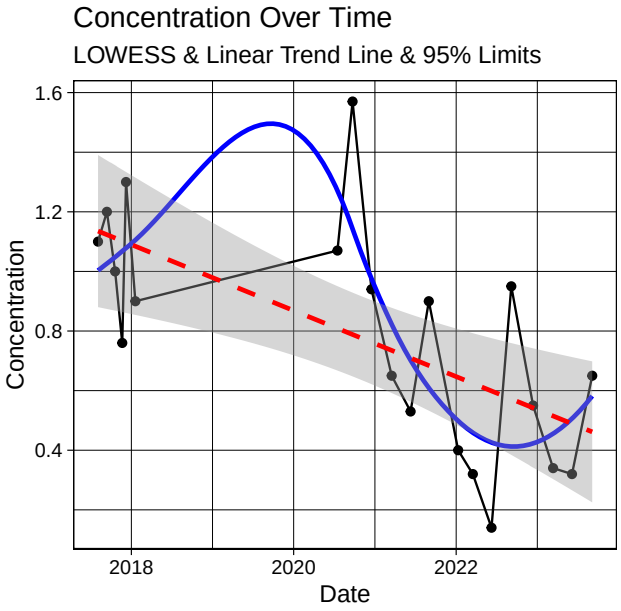
Report for ID : MW249 and Analyte : PFOS

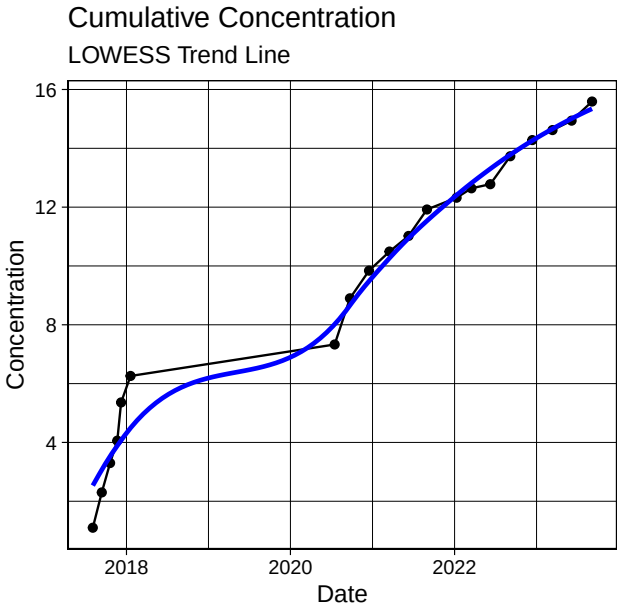




Kendall Trend Test Results Continuous	
n	20
z	-3.18
p	0
S	-99
varS	947
tau	-0.53
mean	0.78
sd	0.38
cov	0.48
results	DECREASING

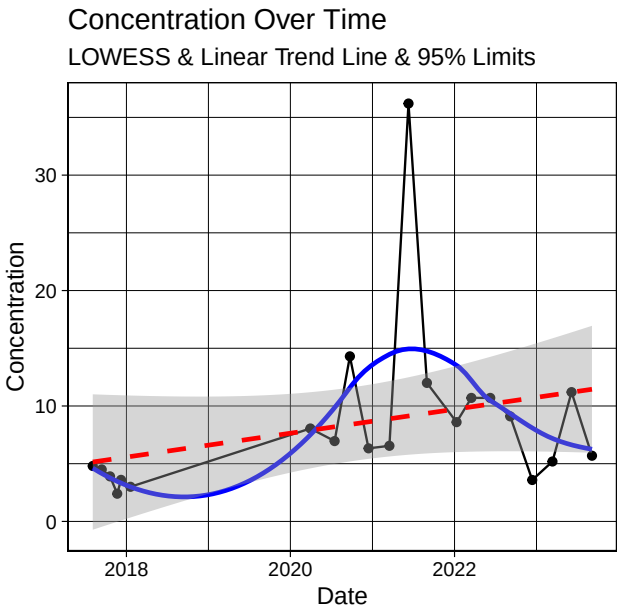
Report for ID : MW255 and Analyte : PFOS

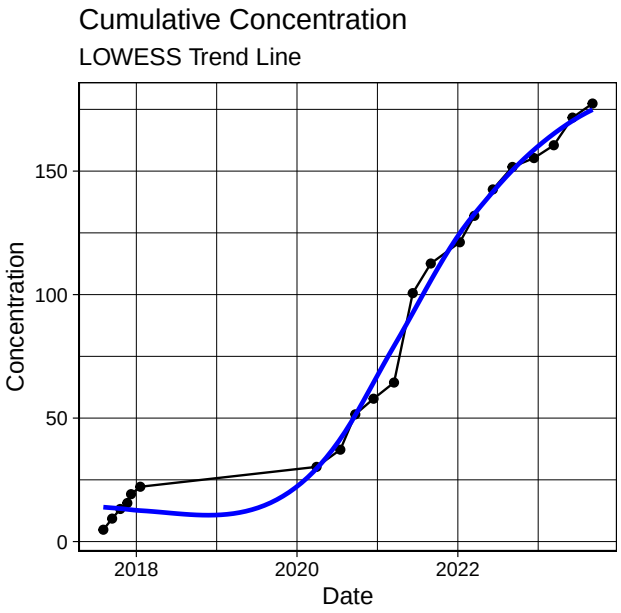




Kendall Trend Test Results Continuous	
n	21
z	1.63
p	0.1
S	55
varS	1095.67
tau	0.26
mean	8.45
sd	7.17
cov	0.85
results	NO CLEAR TREND

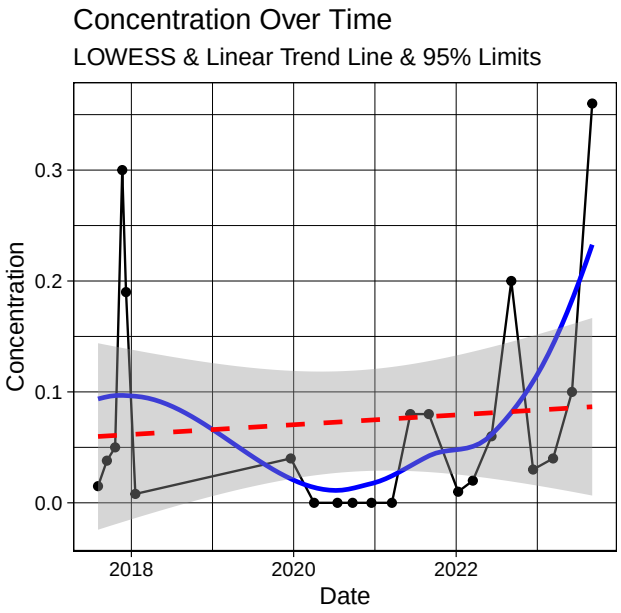
Report for ID : MW256 and Analyte : PFOS

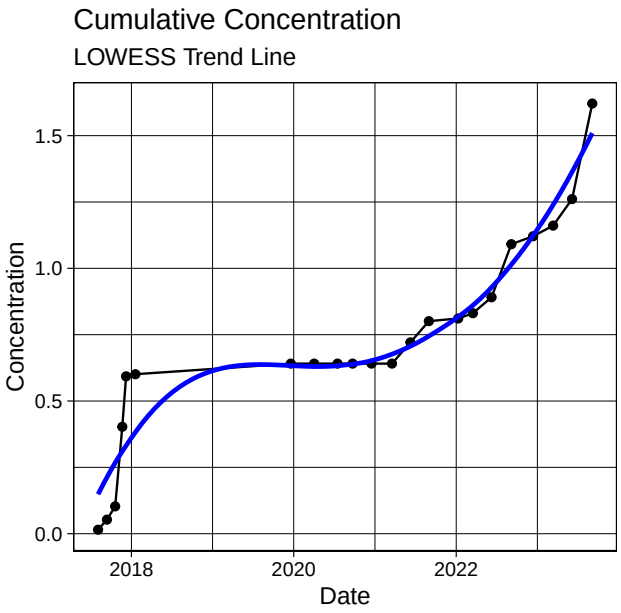




Kendall Trend Test Results Continuous	
n	22
z	1.25
p	0.21
S	45
varS	1239
tau	0.2
mean	0.07
sd	0.1
cov	1.36
results	NO CLEAR TREND

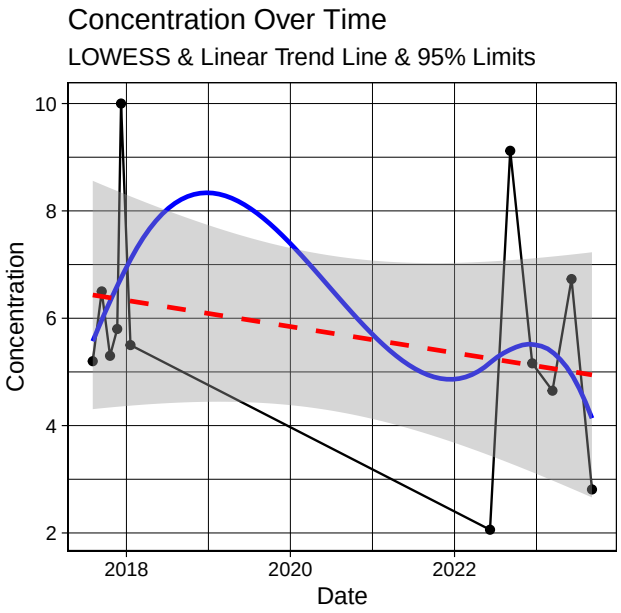
Report for ID : MW257 and Analyte : PFOS

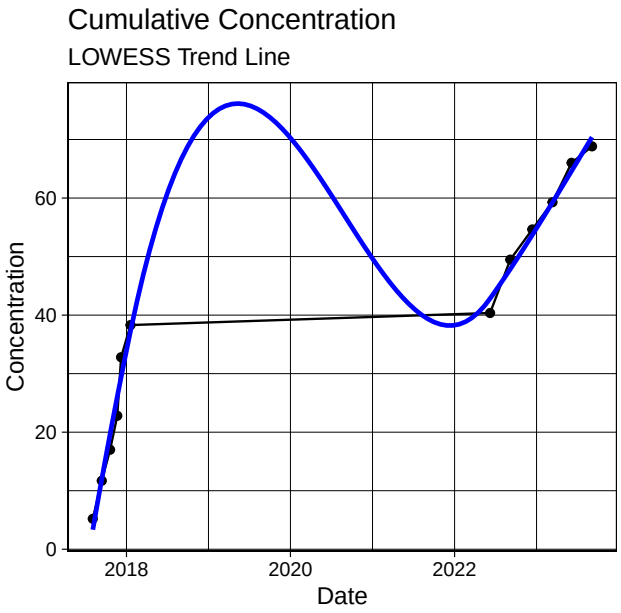




Kendall Trend Test Results Continuous	
n	12
z	-0.75
p	0.45
S	-12
varS	212.67
tau	-0.18
mean	5.74
sd	2.24
cov	0.39
results	STABLE

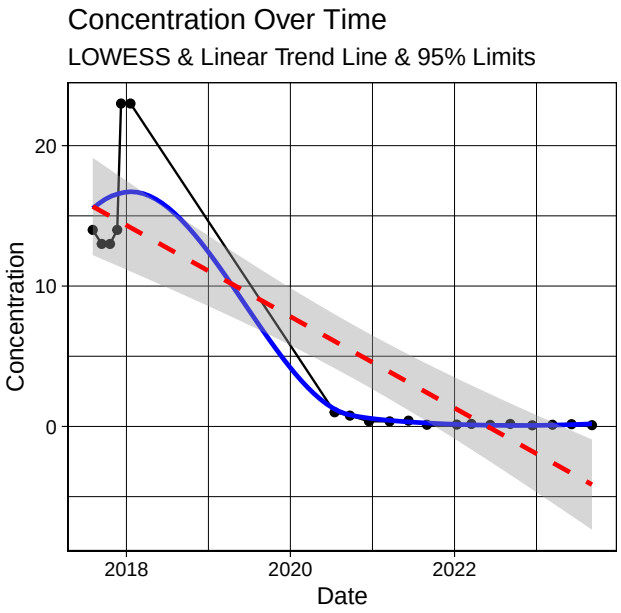
Report for ID : MW258 and Analyte : PFOS

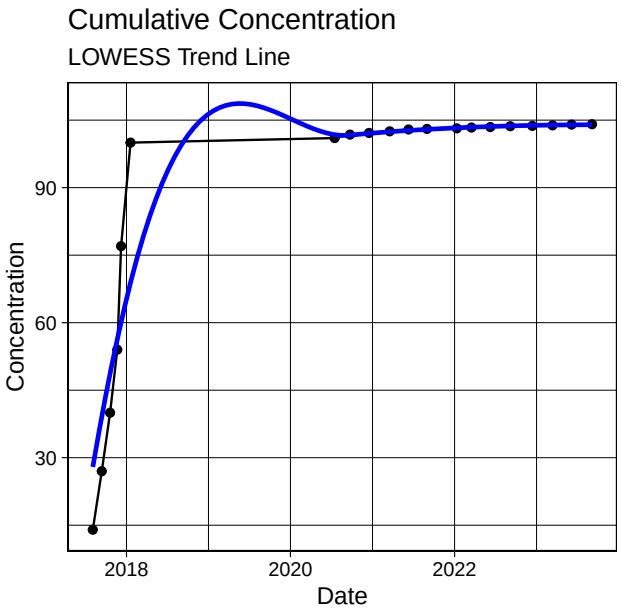




Kendall Trend Test Results Continuous	
n	20
z	-4.29
p	0
S	-133
varS	945
tau	-0.71
mean	5.2
sd	8.11
cov	1.56
results	DECREASING

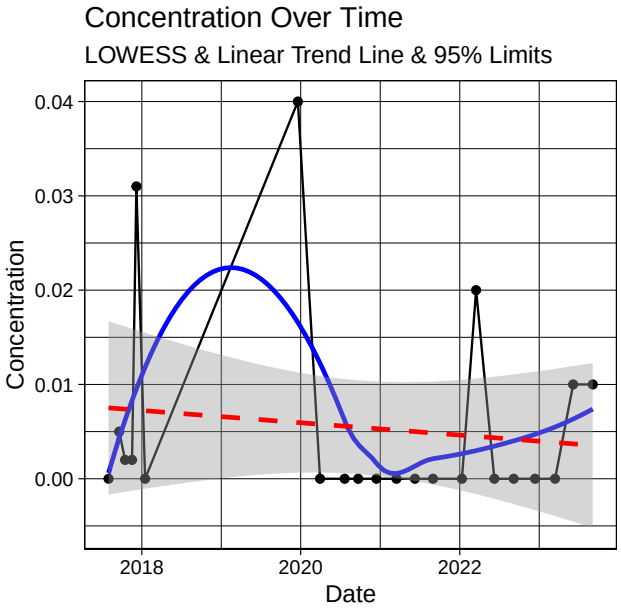
Report for ID : MW259 and Analyte : PFOS

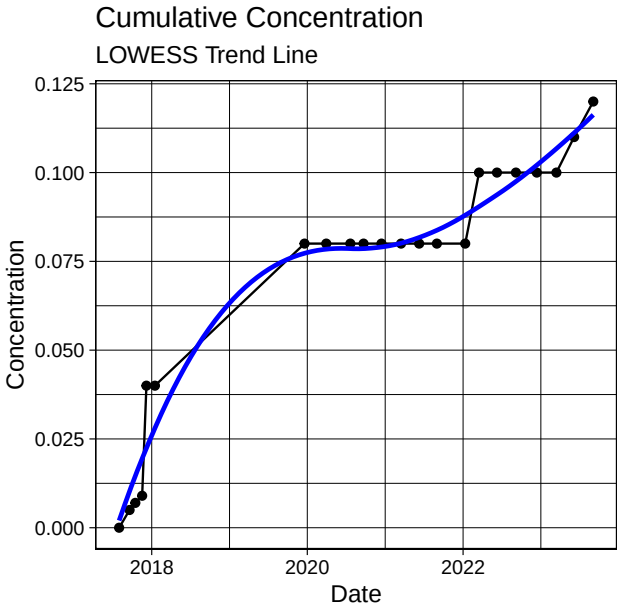




Kendall Trend Test Results Continuous	
n	22
z	-0.56
p	0.58
S	-18
varS	922
tau	-0.1
mean	0.01
sd	0.01
cov	2.02
results	NO CLEAR TREND

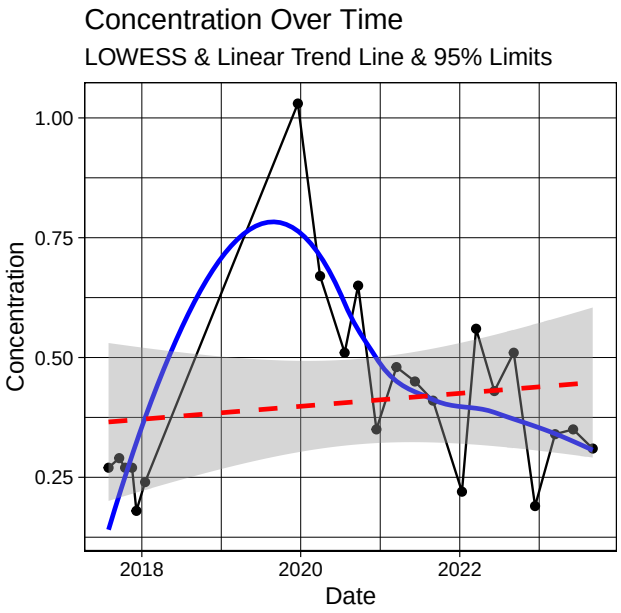
Report for ID : MW268 and Analyte : PFOS

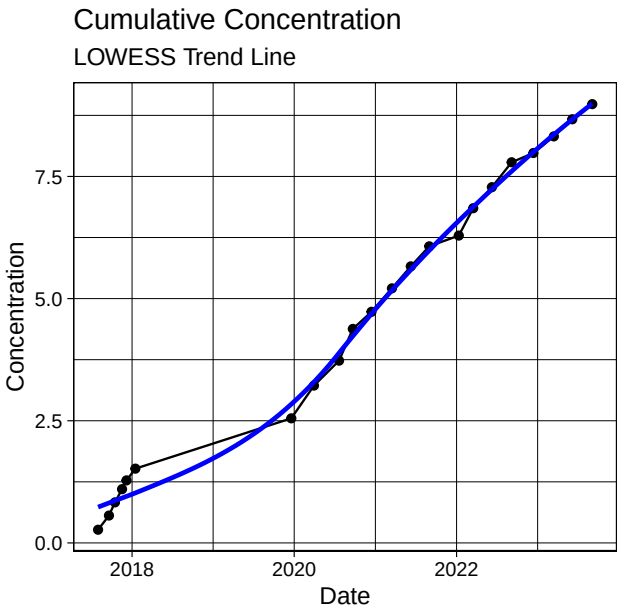




Kendall Trend Test Results Continuous	
n	22
z	0.03
p	0.98
S	2
varS	1252
tau	0.01
mean	0.41
sd	0.2
cov	0.48
results	NO CLEAR TREND

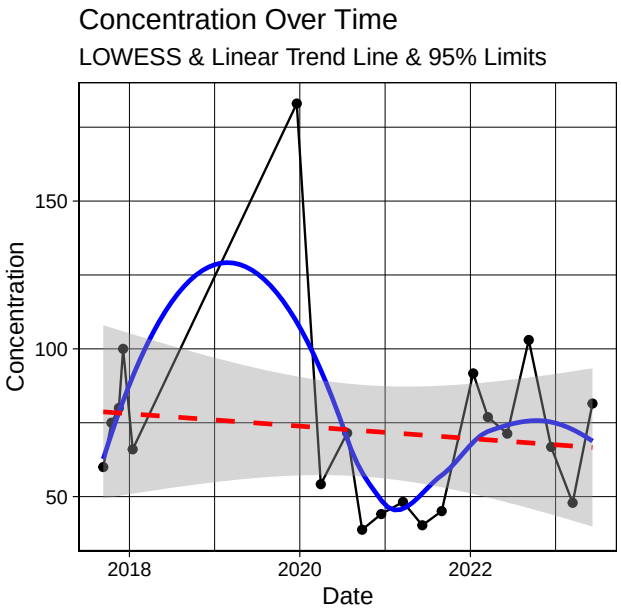
Report for ID : MW269 and Analyte : PFOS

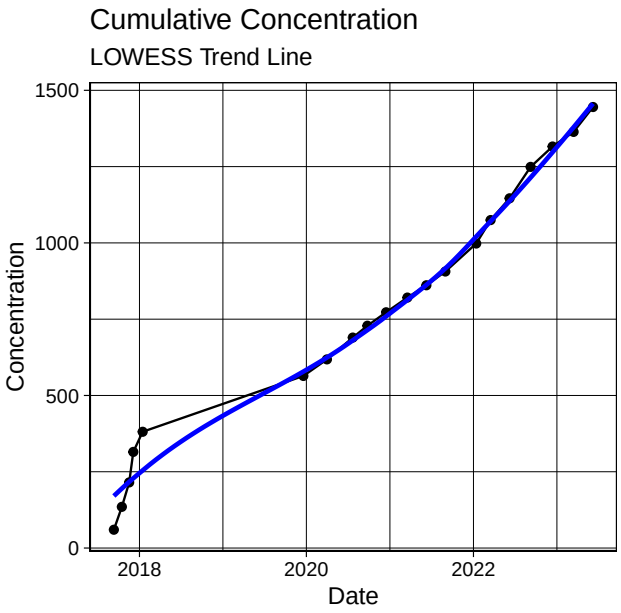




Kendall Trend Test Results Continuous	
n	20
z	-0.1
p	0.92
S	-4
varS	950
tau	-0.02
mean	72.26
sd	32.38
cov	0.45
results	STABLE

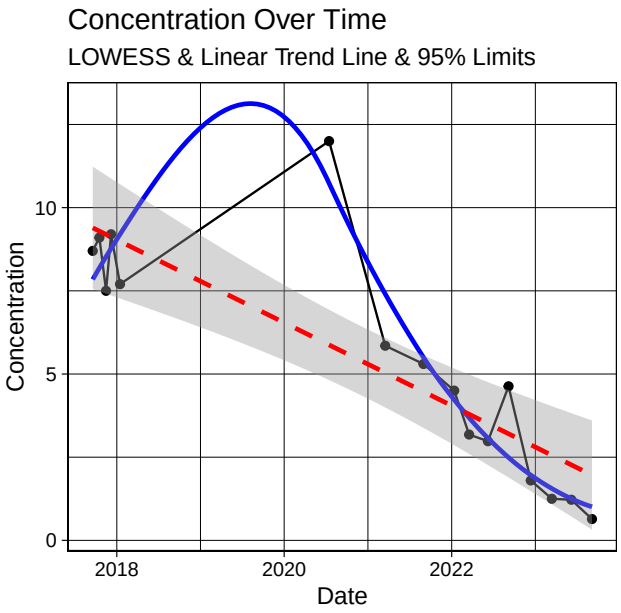
Report for ID : MW282 and Analyte : PFOS

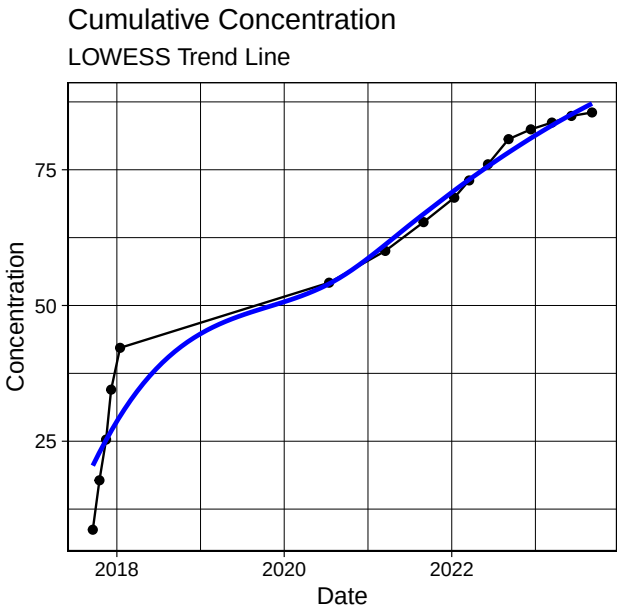




Kendall Trend Test Results Continuous	
n	16
z	-4.19
p	0
S	-94
varS	493.33
tau	-0.78
mean	5.35
sd	3.42
cov	0.64
results	DECREASING

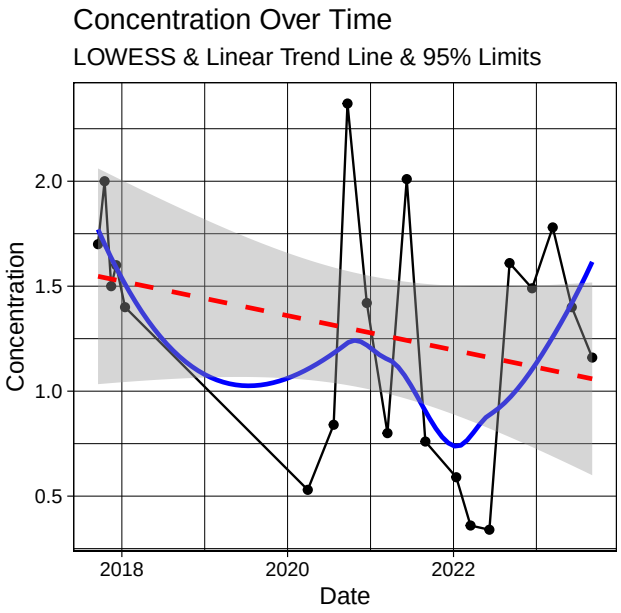
Report for ID : MW288 and Analyte : PFOS

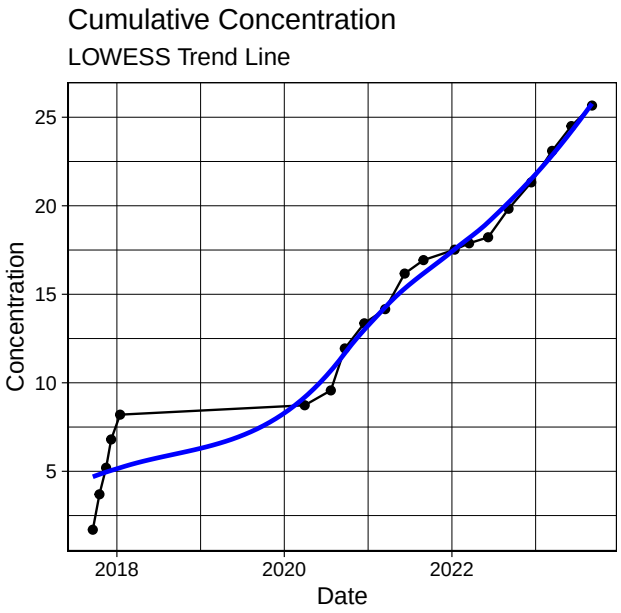




Kendall Trend Test Results Continuous	
n	20
z	-1.36
p	0.17
S	-43
varS	949
tau	-0.23
mean	1.28
sd	0.58
cov	0.46
results	STABLE

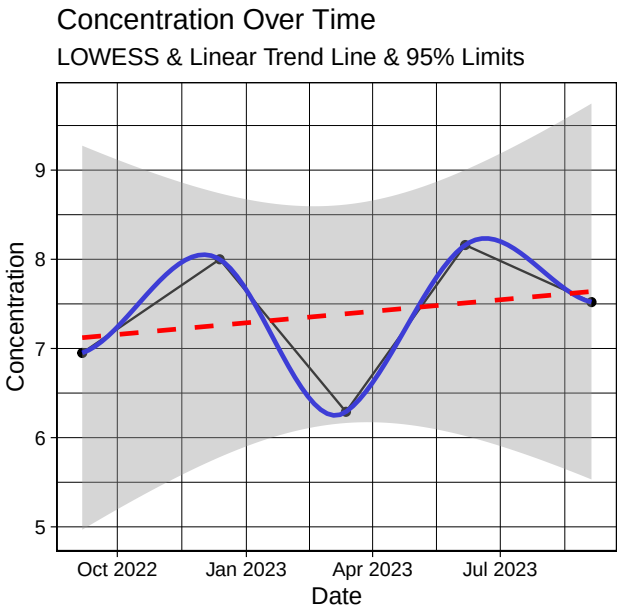
Report for ID : MW289 and Analyte : PFOS

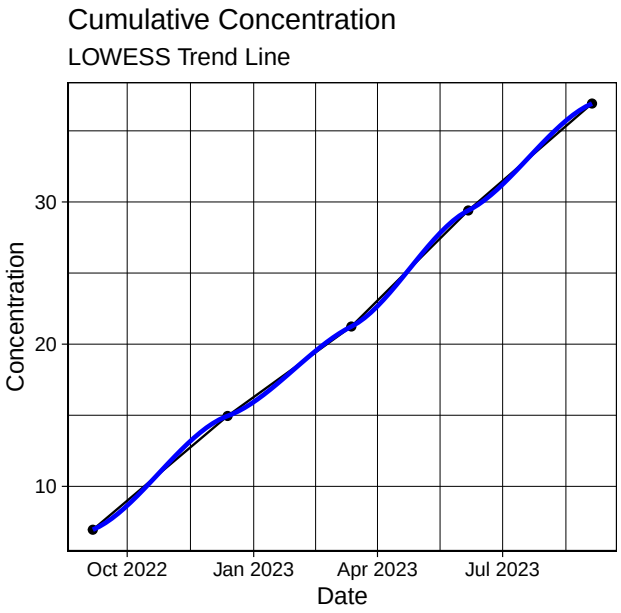




Kendall Trend Test Results Continuous	
n	5
z	0.24
p	0.81
S	2
varS	16.67
tau	0.2
mean	7.38
sd	0.77
cov	0.1
results	NO CLEAR TREND

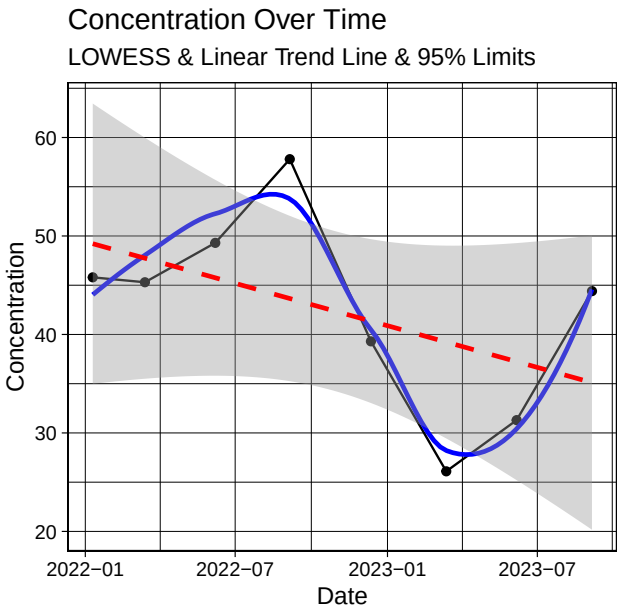
Report for ID : MW496 and Analyte : PFOS

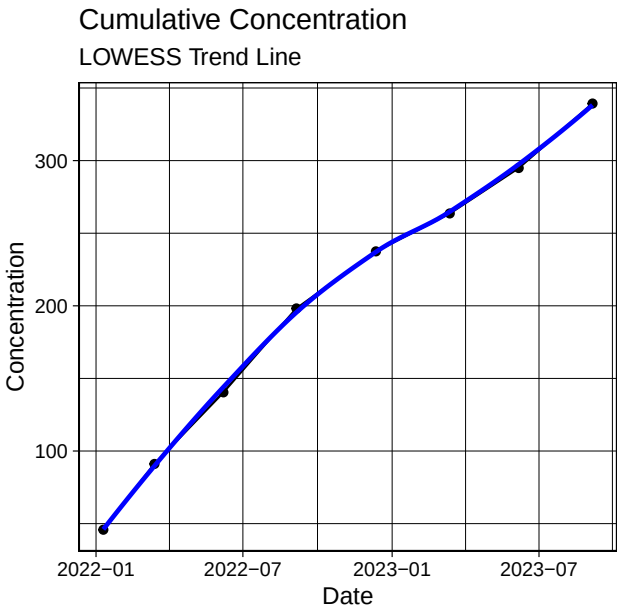




Kendall Trend Test Results Continuous	
n	8
z	-1.11
p	0.27
S	-10
varS	65.33
tau	-0.36
mean	42.41
sd	10.05
cov	0.24
results	STABLE

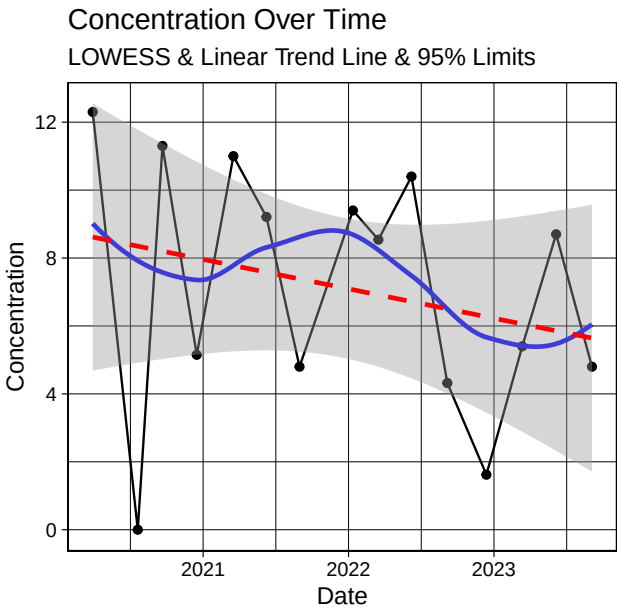
Report for ID : MW500 and Analyte : PFOS

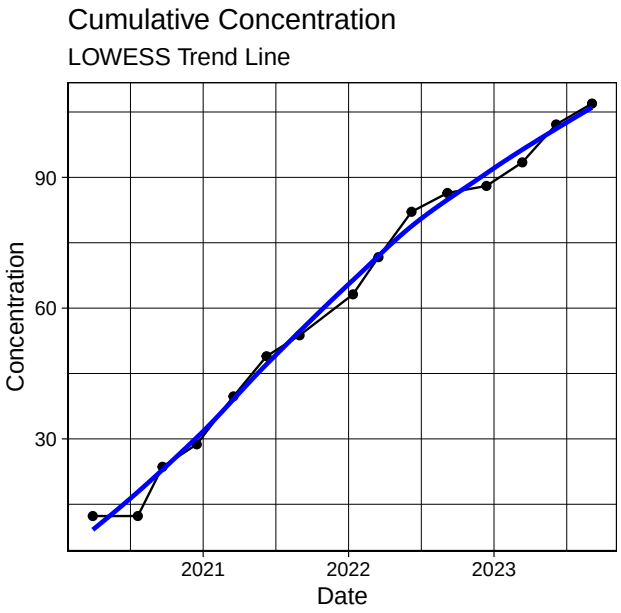




Kendall Trend Test Results Continuous	
n	15
z	-1.44
p	0.15
S	-30
varS	407.33
tau	-0.29
mean	7.13
sd	3.69
cov	0.52
results	STABLE

Report for ID : MW516 and Analyte : PFOS





Trend Report

Report Date & Time: 2024-04-21 07:32:25

Data File Name: 0089_MKA_PFOA_input.csv

Report Title: Groundwater PFOA Trend

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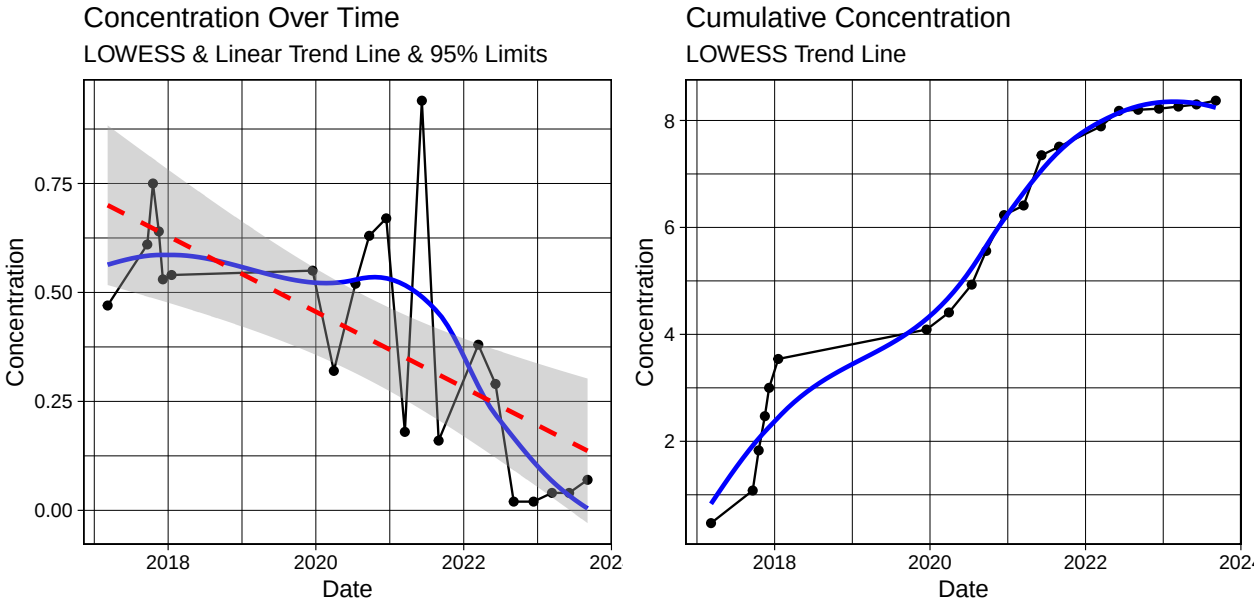
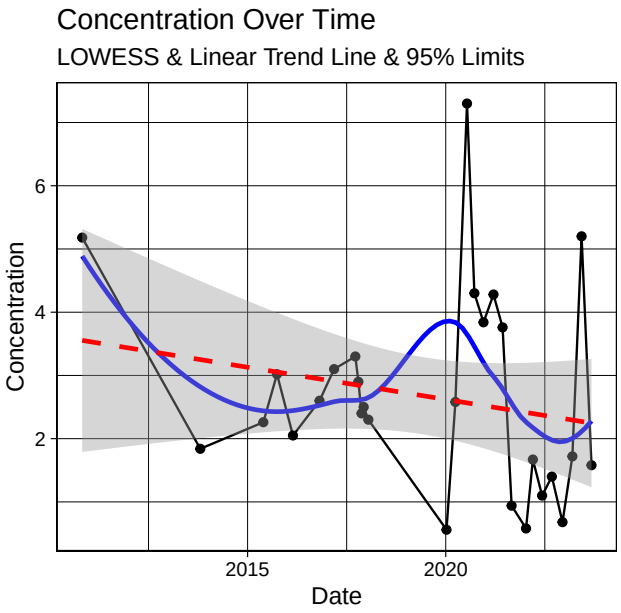
Kendall Trend Test Results Continuous	
n	21
z	-2.99
p	0
S	-100
varS	1094.67
tau	-0.48
mean	0.4
sd	0.27
cov	0.69
results	DECREASING

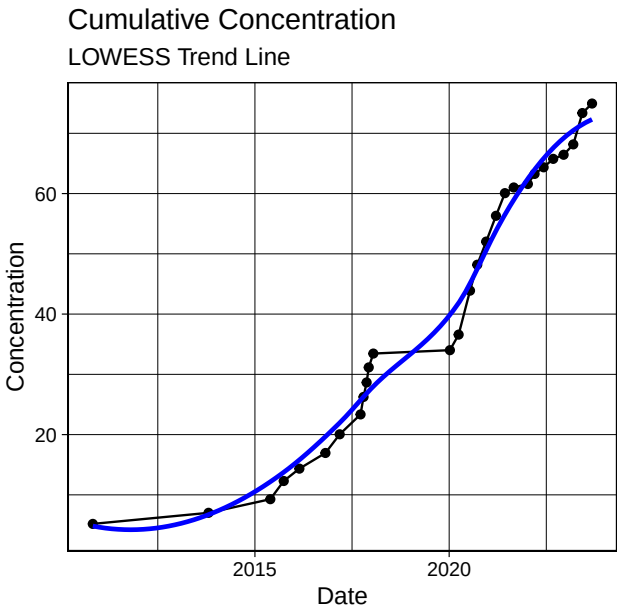
Report for ID : MW109 and Analyte : PFOA



Kendall Trend Test Results Continuous	
n	28
z	-1.21
p	0.23
S	-62
varS	2562
tau	-0.16
mean	2.68
sd	1.58
cov	0.59
results	STABLE

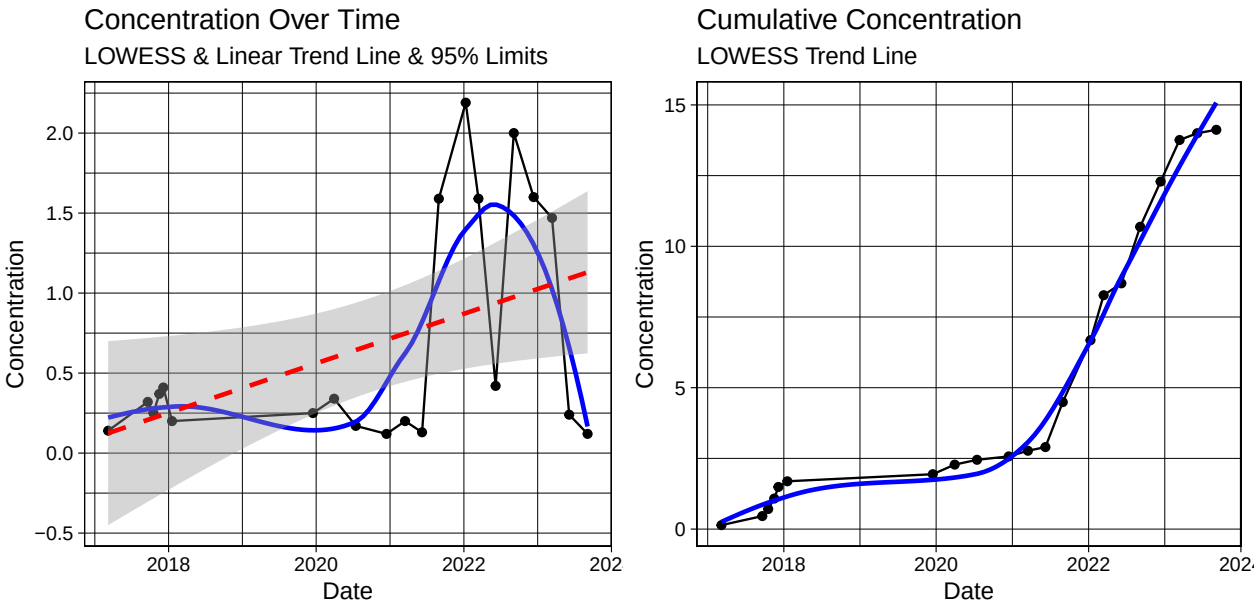
Report for ID : MW112 and Analyte : PFOA





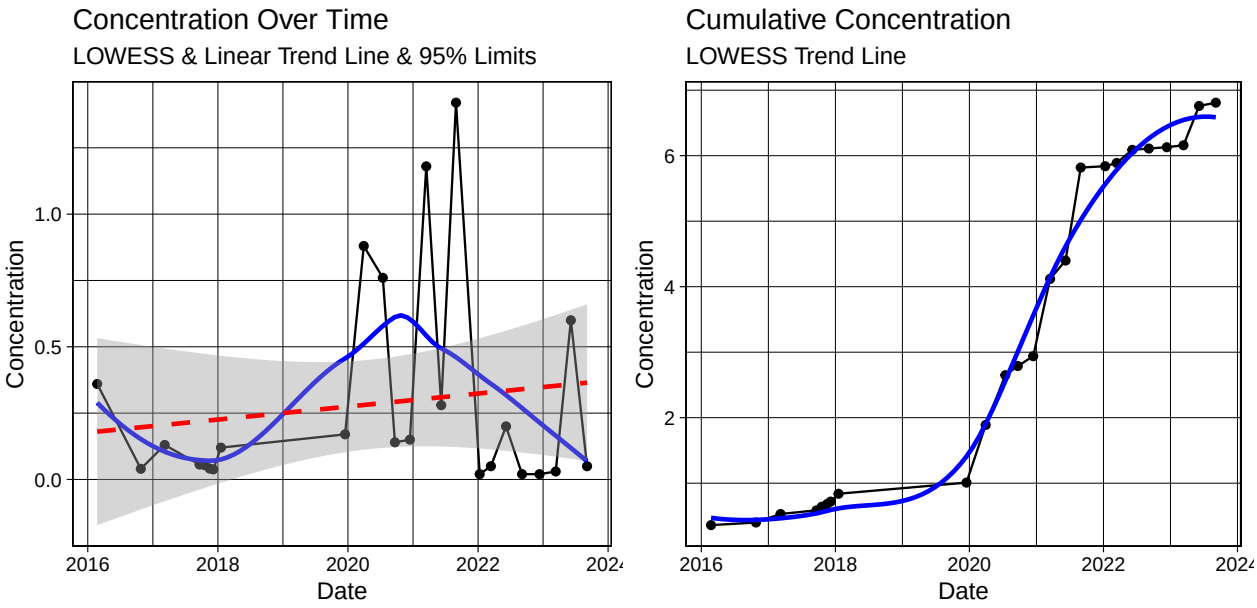
Kendall Trend Test Results Continuous	
n	21
z	1
p	0.32
S	34
varS	1092.67
tau	0.16
mean	0.67
sd	0.71
cov	1.06
results	NO CLEAR TREND

Report for ID : MW120 and Analyte : PFOA



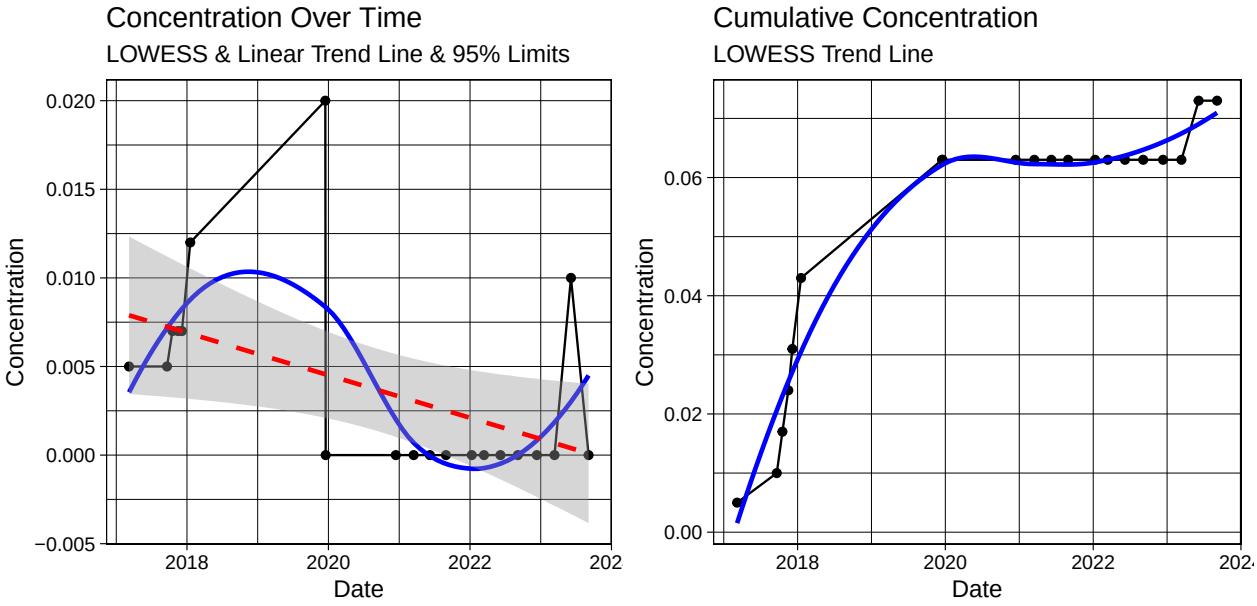
Kendall Trend Test Results Continuous	
n	24
z	-0.22
p	0.82
S	-10
varS	1620.67
tau	-0.04
mean	0.28
sd	0.39
cov	1.39
results	NO CLEAR TREND

Report for ID : MW121 and Analyte : PFOA



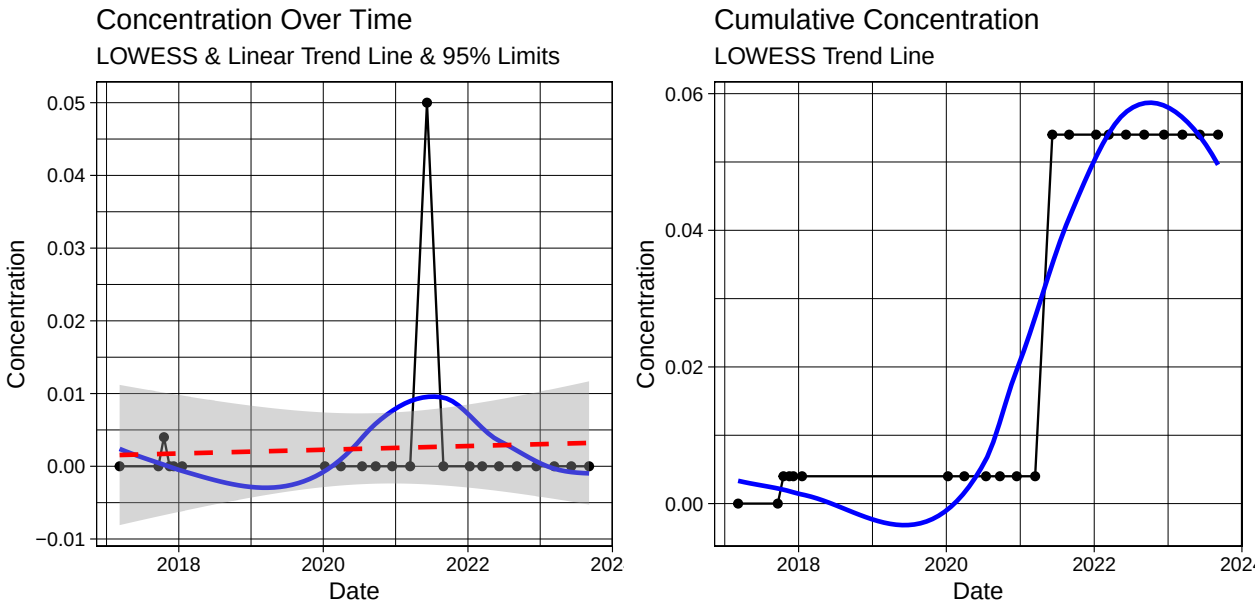
Kendall Trend Test Results Continuous	
n	20
z	-1.96
p	0.05
S	-54
varS	732.67
tau	-0.36
mean	0
sd	0.01
cov	1.51
results	POSSIBLY DECREASING

Report for ID : MW123 and Analyte : PFOA



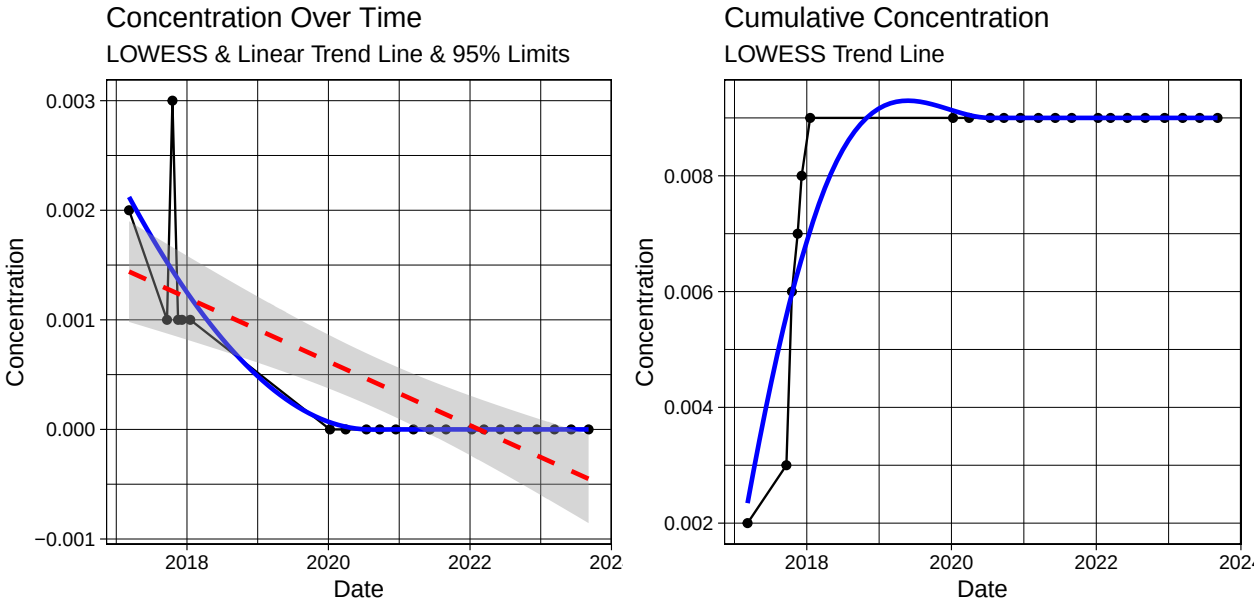
Kendall Trend Test Results Continuous	
n	22
z	-0.68
p	0.49
S	-13
varS	307.67
tau	-0.13
mean	0
sd	0.01
cov	4.34
results	NO CLEAR TREND

Report for ID : MW124 and Analyte : PFOA



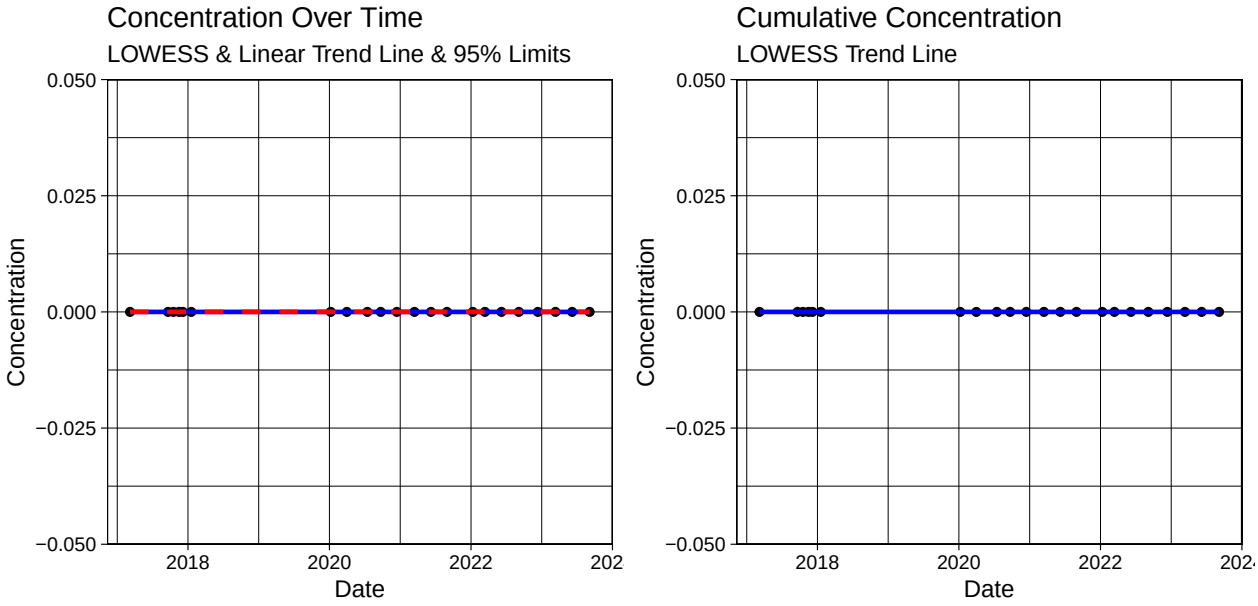
Kendall Trend Test Results Continuous	
n	22
z	-3.64
p	0
S	-101
varS	755.67
tau	-0.65
mean	0
sd	0
cov	1.95
results	DECREASING

Report for ID : MW125 and Analyte : PFOA



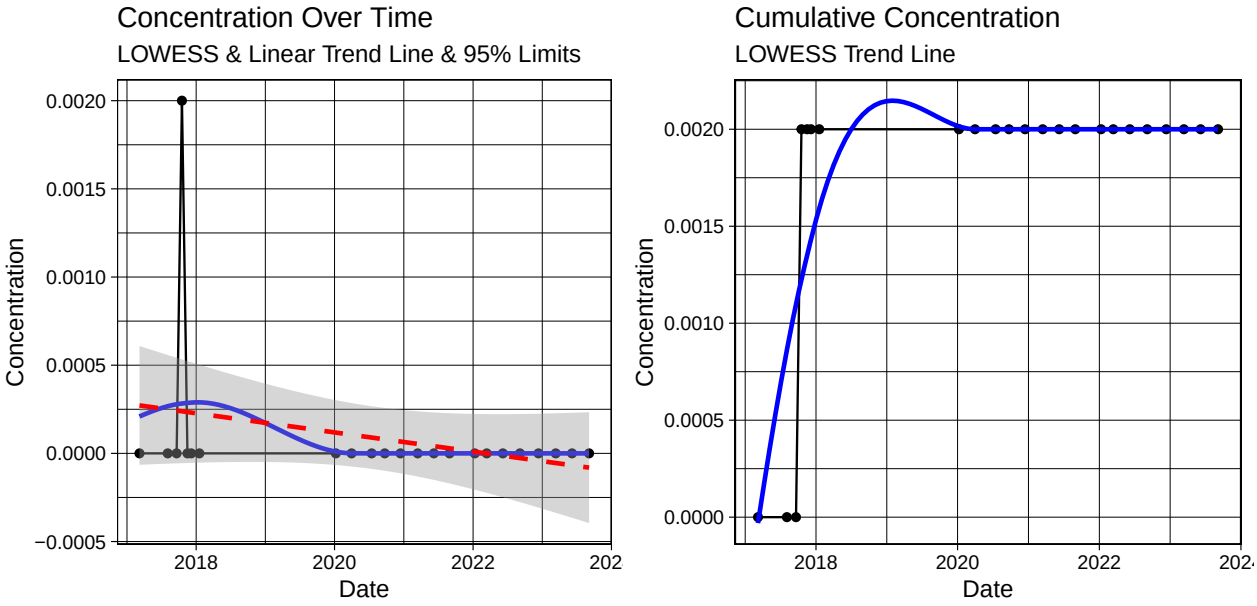
Kendall Trend Test Results Continuous	
n	22
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

Report for ID : MW126 and Analyte : PFOA



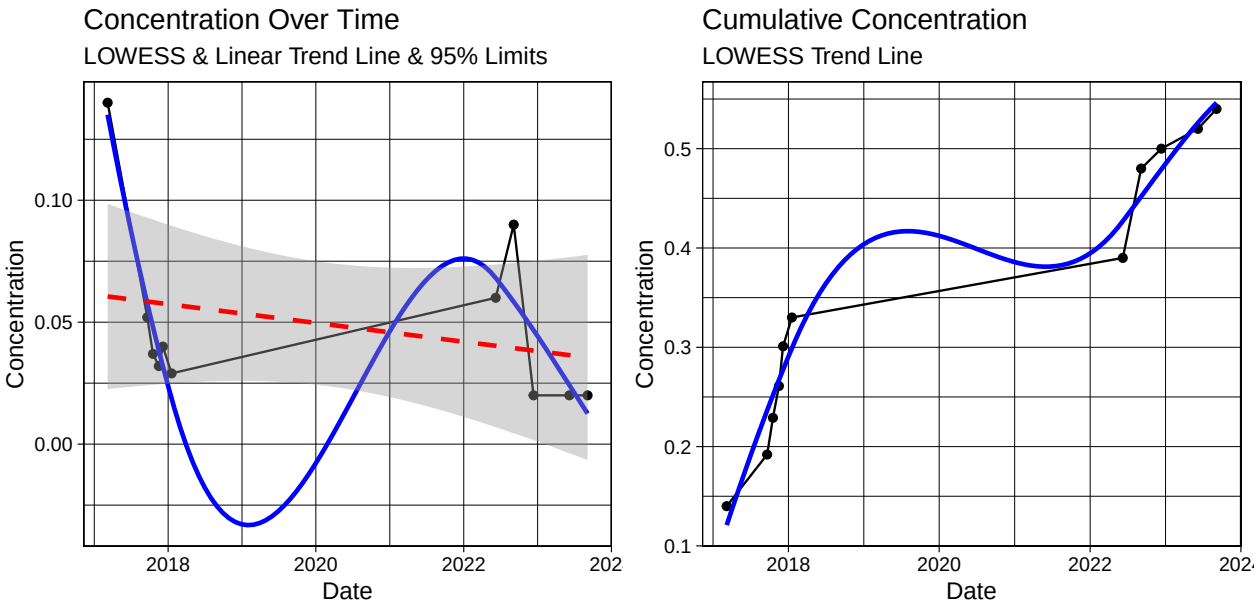
Kendall Trend Test Results Continuous	
n	23
z	-1.13
p	0.26
S	-16
varS	176
tau	-0.21
mean	0
sd	0
cov	4.8
results	NO CLEAR TREND

Report for ID : MW127 and Analyte : PFOA



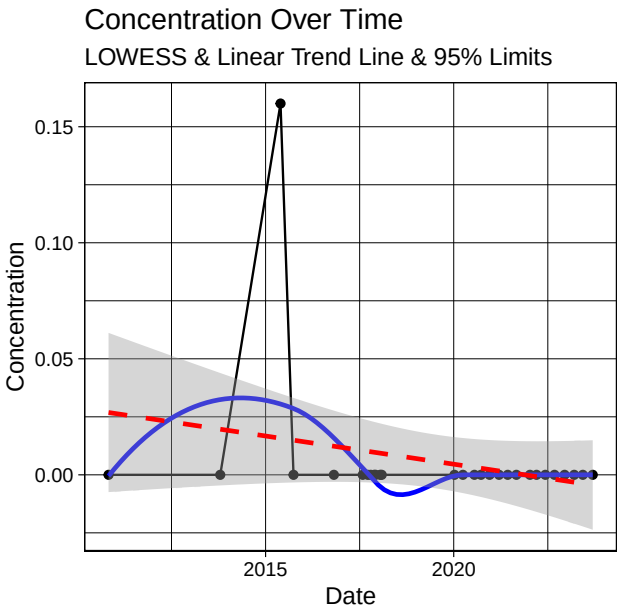
Kendall Trend Test Results Continuous	
n	11
z	-1.97
p	0.05
S	-26
varS	161.33
tau	-0.49
mean	0.05
sd	0.04
cov	0.75
results	DECREASING

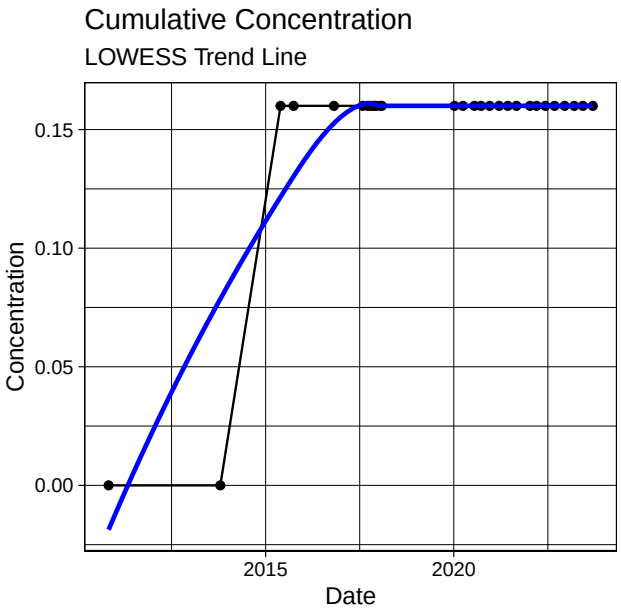
Report for ID : MW128 and Analyte : PFOA



Kendall Trend Test Results Continuous	
n	28
z	-1.36
p	0.17
S	-23
varS	261
tau	-0.23
mean	0.01
sd	0.03
cov	5.29
results	NO CLEAR TREND

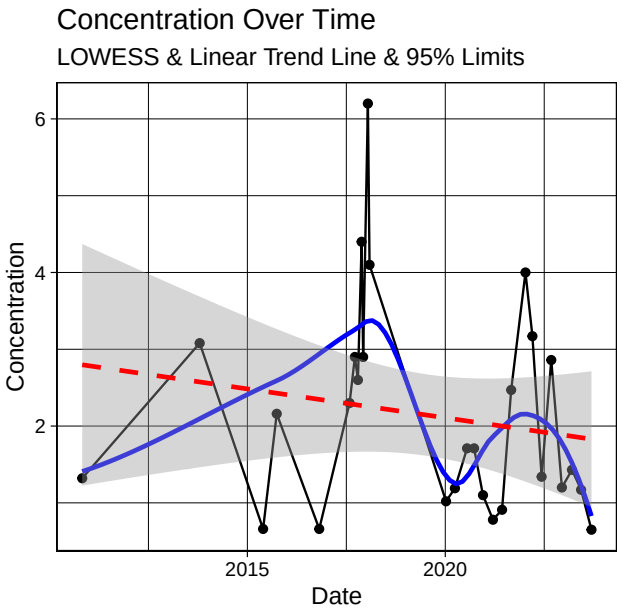
Report for ID : MW139 and Analyte : PFOA

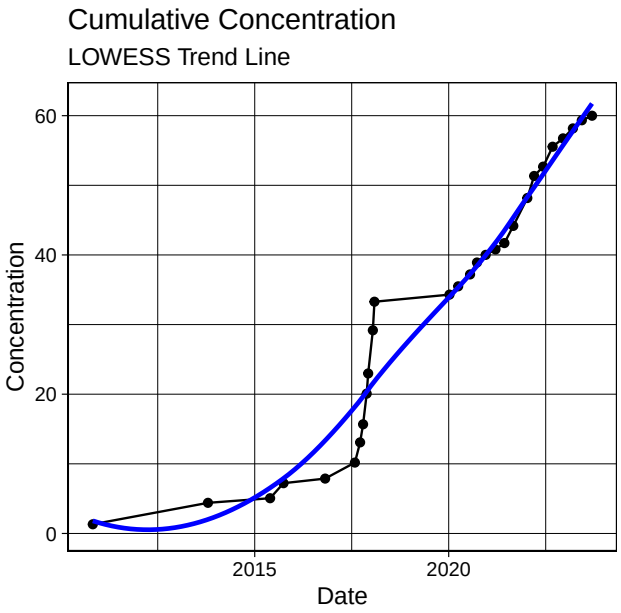




Kendall Trend Test Results Continuous	
n	28
z	-0.87
p	0.38
S	-45
varS	2559
tau	-0.12
mean	2.14
sd	1.36
cov	0.64
results	STABLE

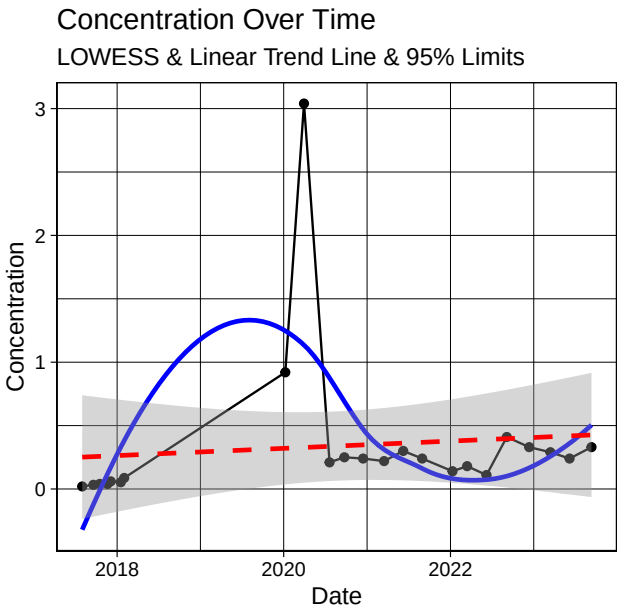
Report for ID : MW141 and Analyte : PFOA

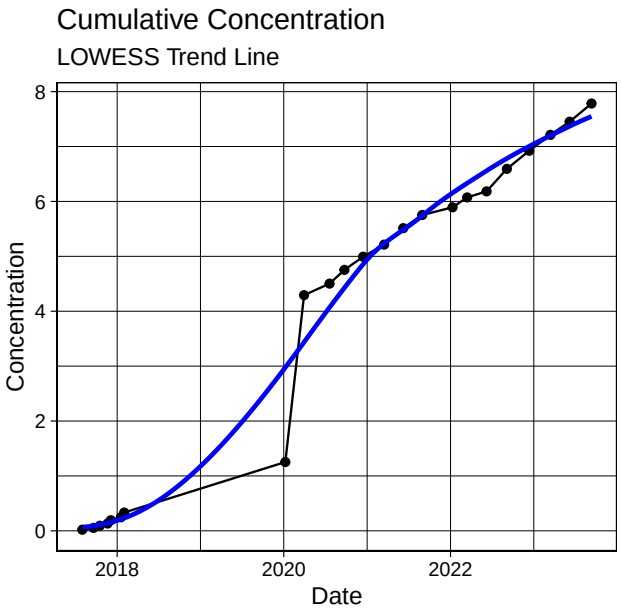




Kendall Trend Test Results Continuous	
n	23
z	3.15
p	0
S	120
varS	1428
tau	0.48
mean	0.34
sd	0.62
cov	1.83
results	INCREASING

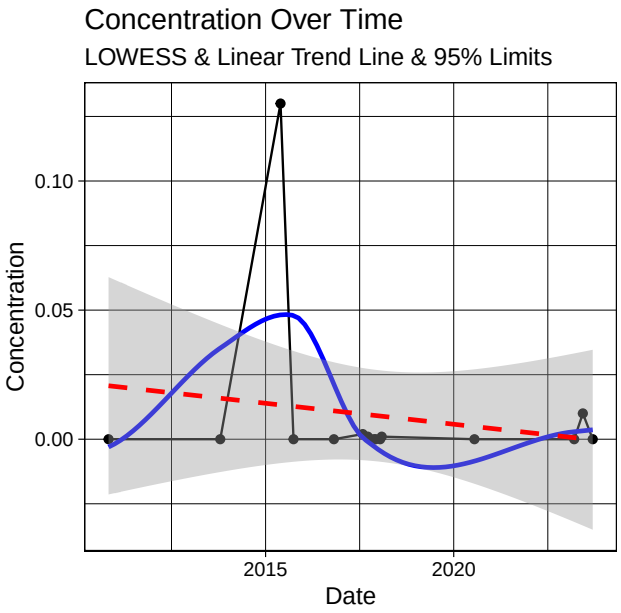
Report for ID : MW142 and Analyte : PFOA

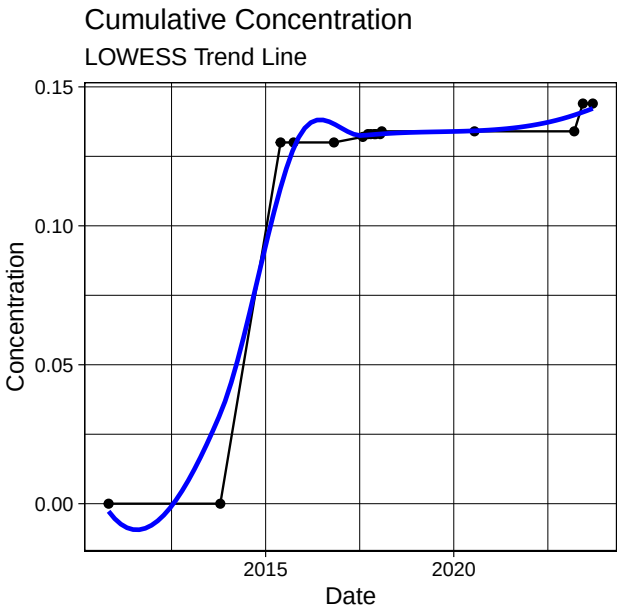




Kendall Trend Test Results Continuous	
n	16
z	-0.06
p	0.96
S	-2
varS	327.33
tau	-0.02
mean	0.01
sd	0.03
cov	3.6
results	NO CLEAR TREND

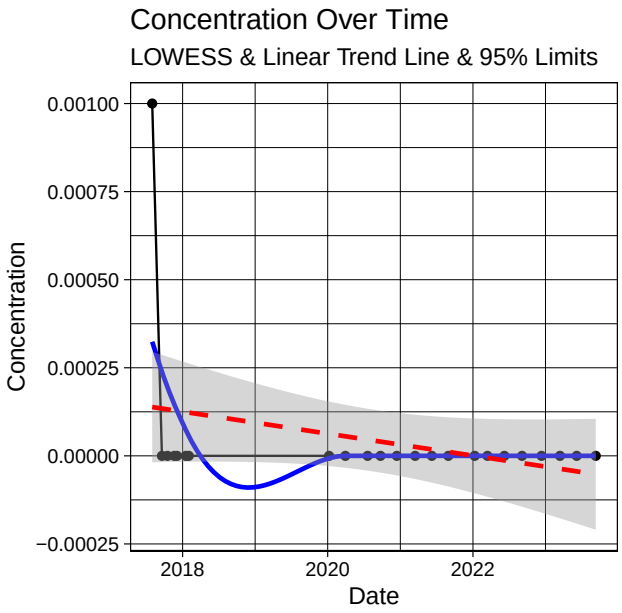
Report for ID : MW147 and Analyte : PFOA

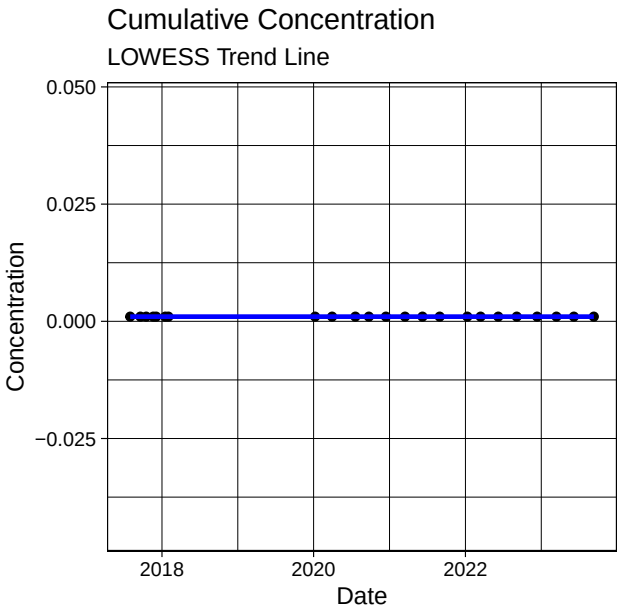




Kendall Trend Test Results Continuous	
n	23
z	-1.58
p	0.11
S	-22
varS	176
tau	-0.29
mean	0
sd	0
cov	4.8
results	NO CLEAR TREND

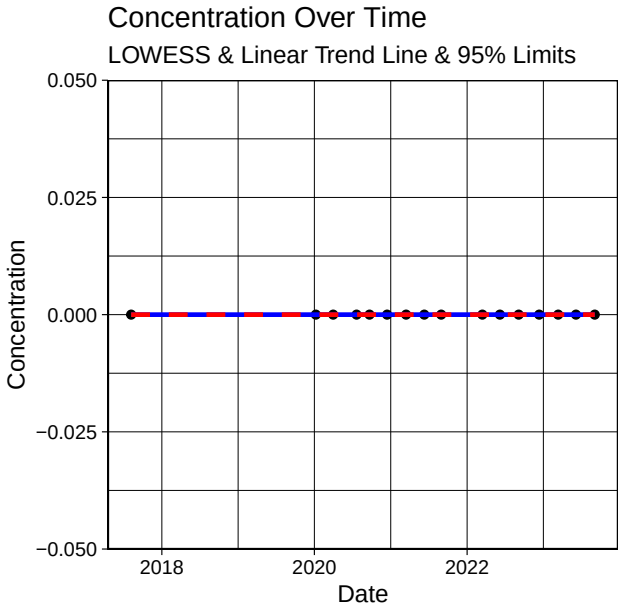
Report for ID : MW149 and Analyte : PFOA

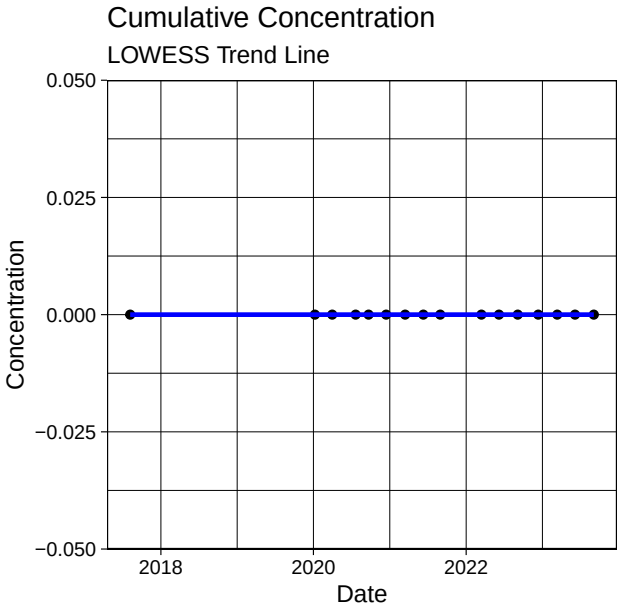




Kendall Trend Test Results Continuous	
n	16
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

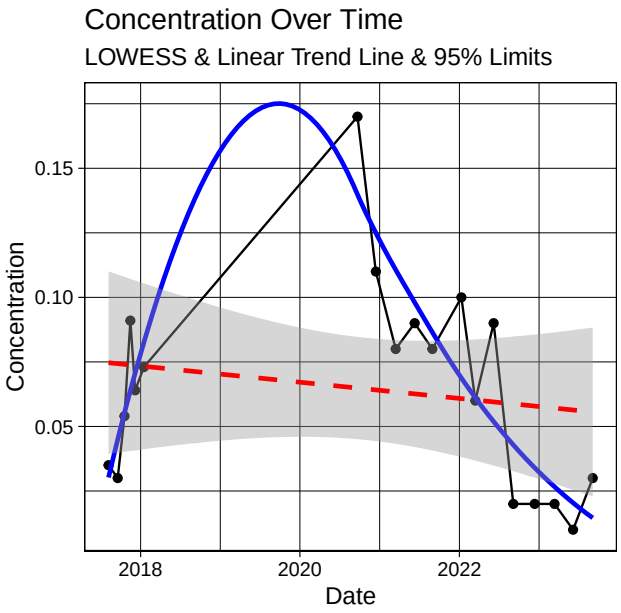
Report for ID : MW158 and Analyte : PFOA

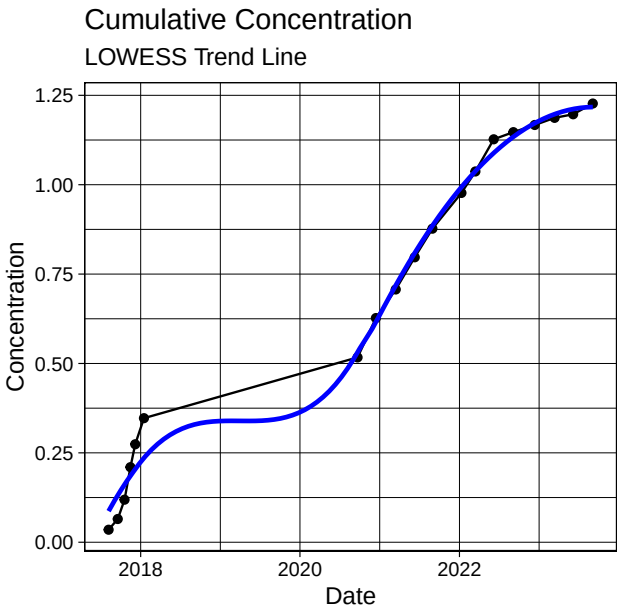




Kendall Trend Test Results Continuous	
n	19
z	-1.26
p	0.21
S	-37
varS	810.33
tau	-0.22
mean	0.06
sd	0.04
cov	0.62
results	STABLE

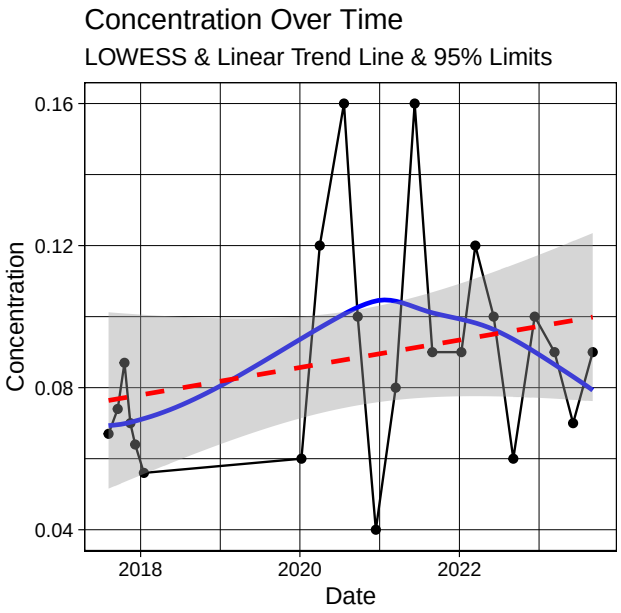
Report for ID : MW161 and Analyte : PFOA

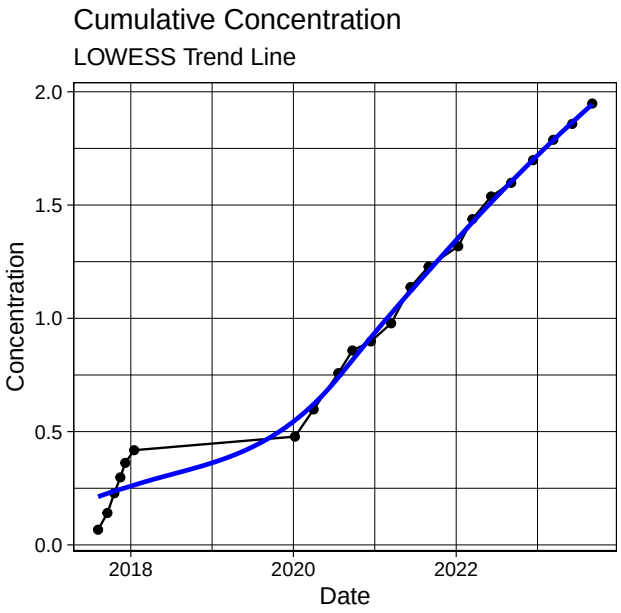




Kendall Trend Test Results Continuous	
n	22
z	0.99
p	0.32
S	36
varS	1241.33
tau	0.16
mean	0.09
sd	0.03
cov	0.35
results	NO CLEAR TREND

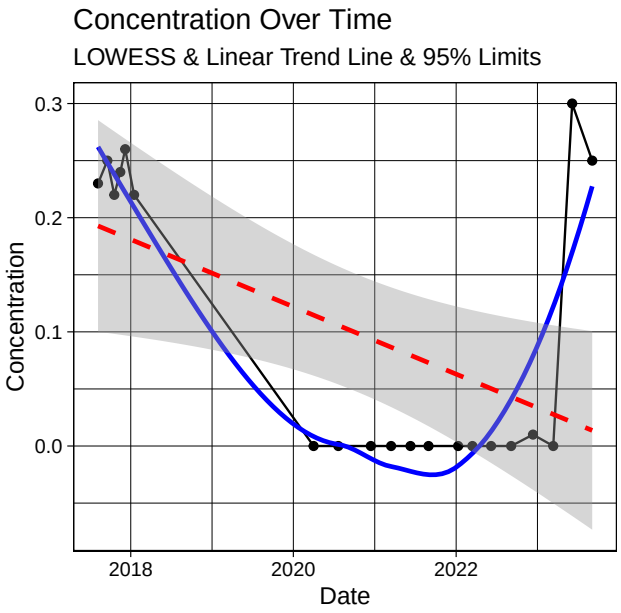
Report for ID : MW166 and Analyte : PFOA

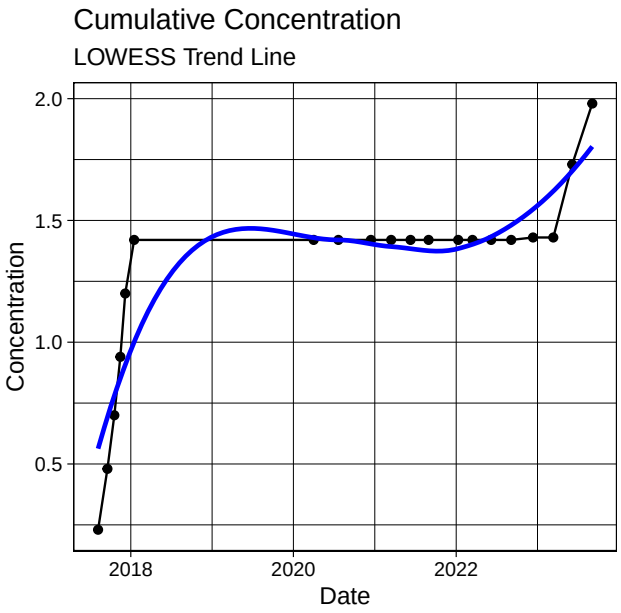




Kendall Trend Test Results Continuous	
n	20
z	-1.07
p	0.28
S	-31
varS	783
tau	-0.2
mean	0.1
sd	0.12
cov	1.26
results	NO CLEAR TREND

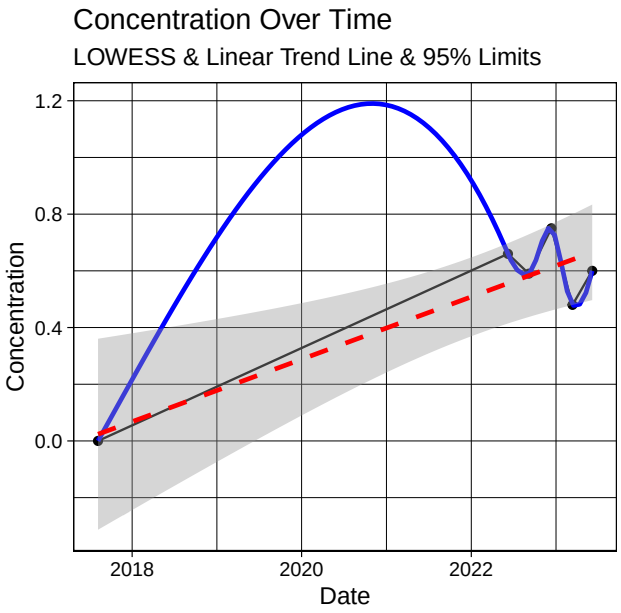
Report for ID : MW171 and Analyte : PFOA

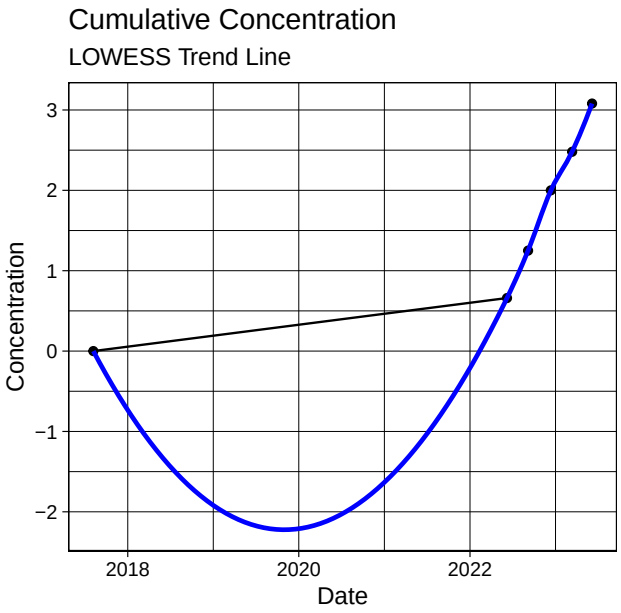




Kendall Trend Test Results Continuous	
n	6
z	0.38
p	0.71
S	3
varS	28.33
tau	0.2
mean	0.51
sd	0.27
cov	0.52
results	NO CLEAR TREND

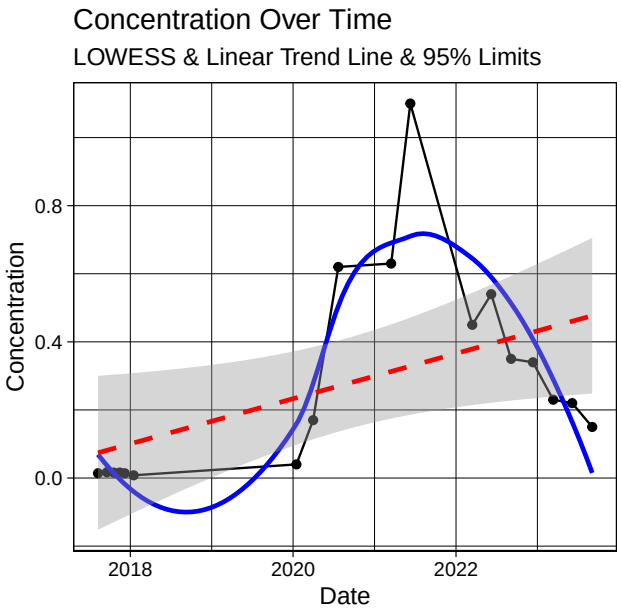
Report for ID : MW172 and Analyte : PFOA

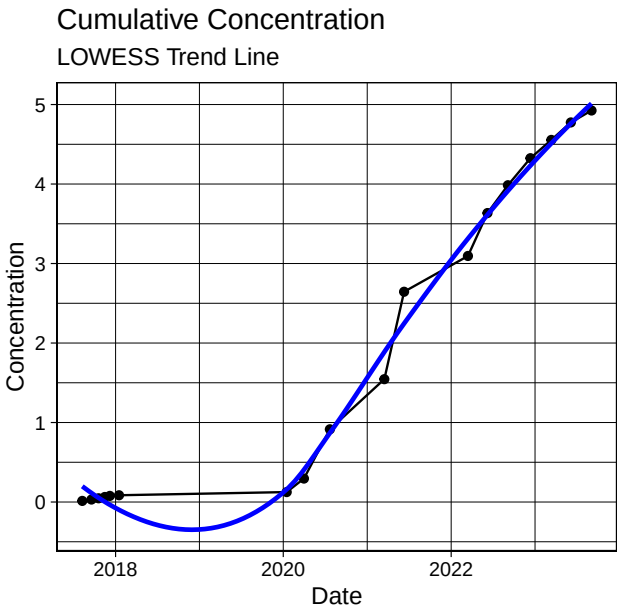




Kendall Trend Test Results Continuous	
n	18
z	1.74
p	0.08
S	47
varS	695
tau	0.31
mean	0.27
sd	0.3
cov	1.1
results	POSSIBLY INCREASING

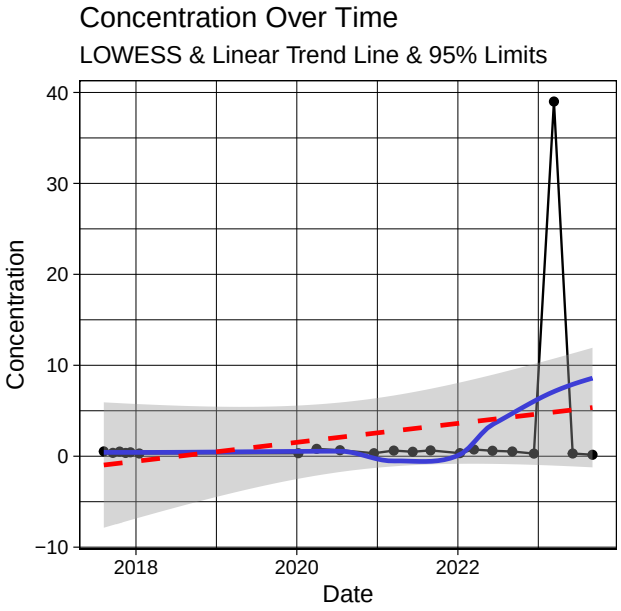
Report for ID : MW173 and Analyte : PFOA

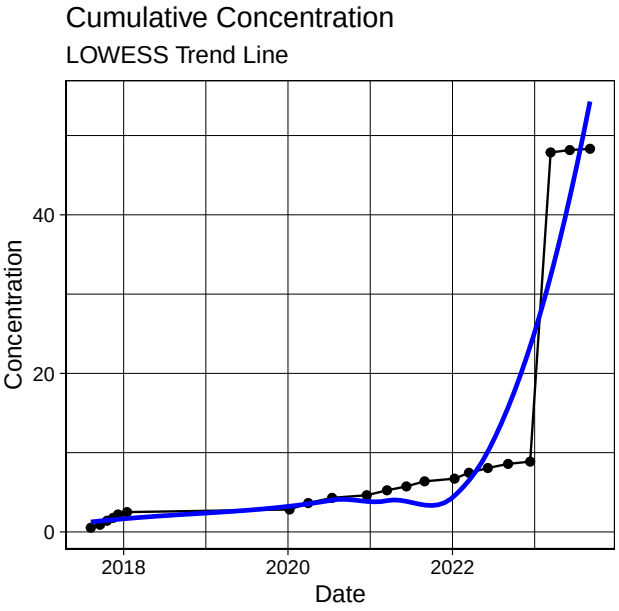




Kendall Trend Test Results Continuous	
n	21
z	-0.39
p	0.69
S	-14
varS	1094.67
tau	-0.07
mean	2.3
sd	8.41
cov	3.65
results	NO CLEAR TREND

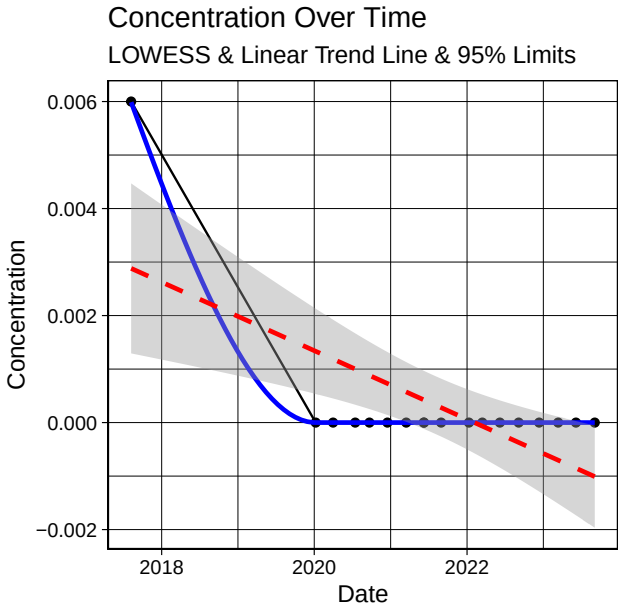
Report for ID : MW193 and Analyte : PFOA

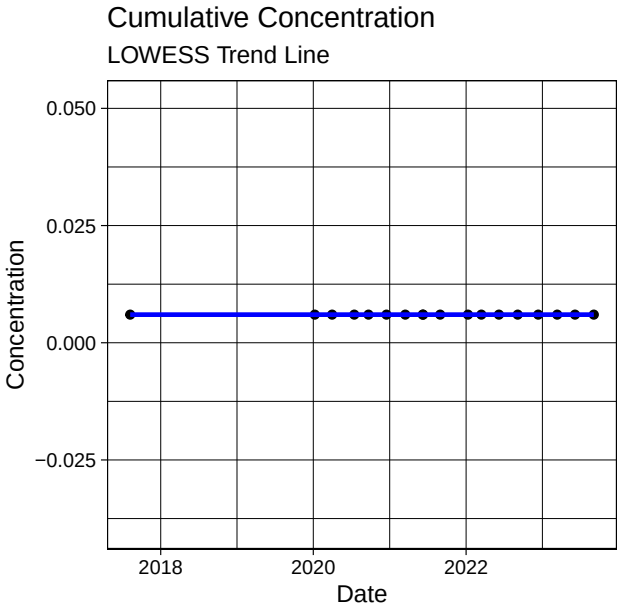




Kendall Trend Test Results Continuous	
n	18
z	-1.54
p	0.12
S	-17
varS	107.67
tau	-0.33
mean	0
sd	0
cov	4.24
results	NO CLEAR TREND

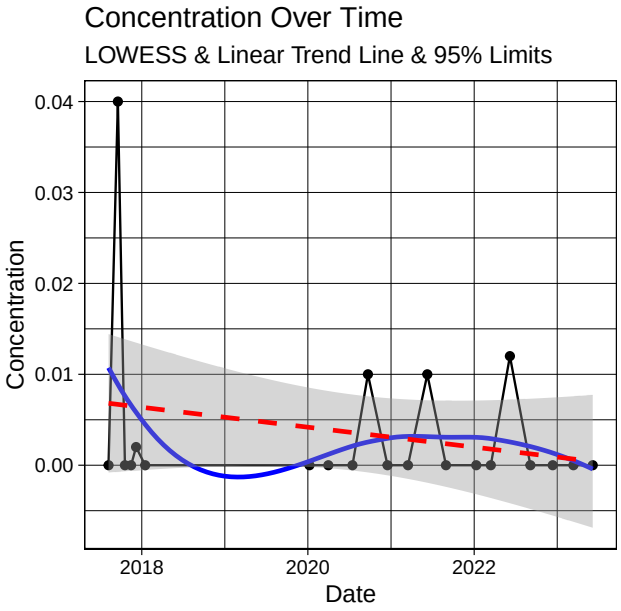
Report for ID : MW195D and Analyte : PFOA

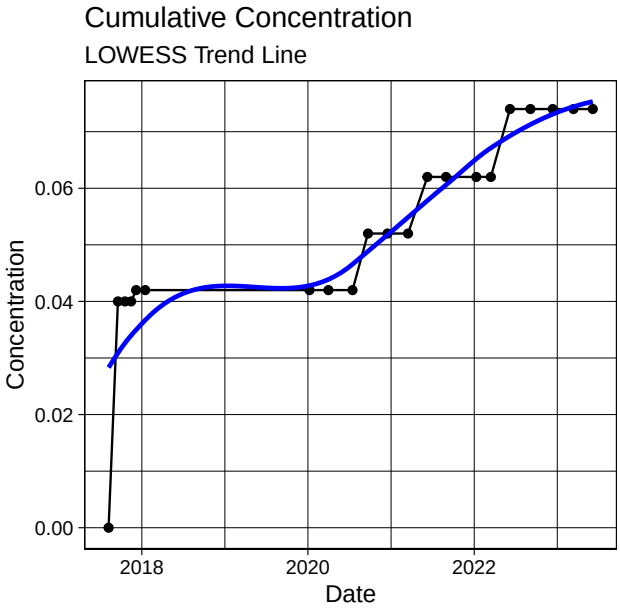




Kendall Trend Test Results Continuous	
n	21
z	-0.57
p	0.57
S	-15
varS	602.33
tau	-0.11
mean	0
sd	0.01
cov	2.61
results	NO CLEAR TREND

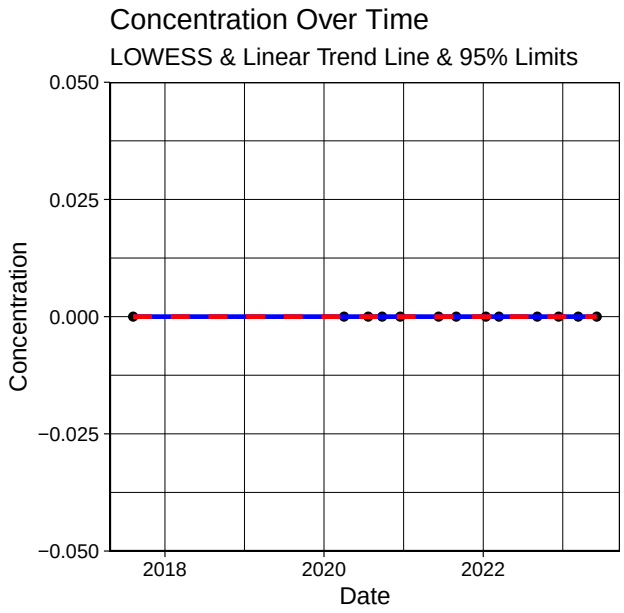
Report for ID : MW195S and Analyte : PFOA

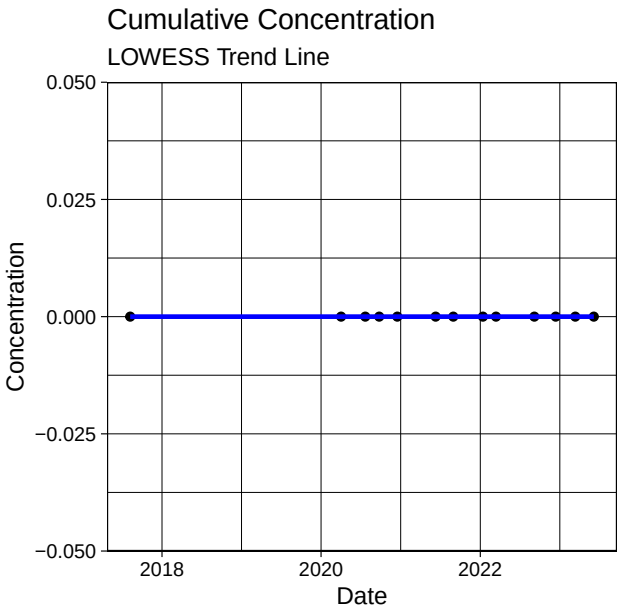




Kendall Trend Test Results Continuous	
n	13
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

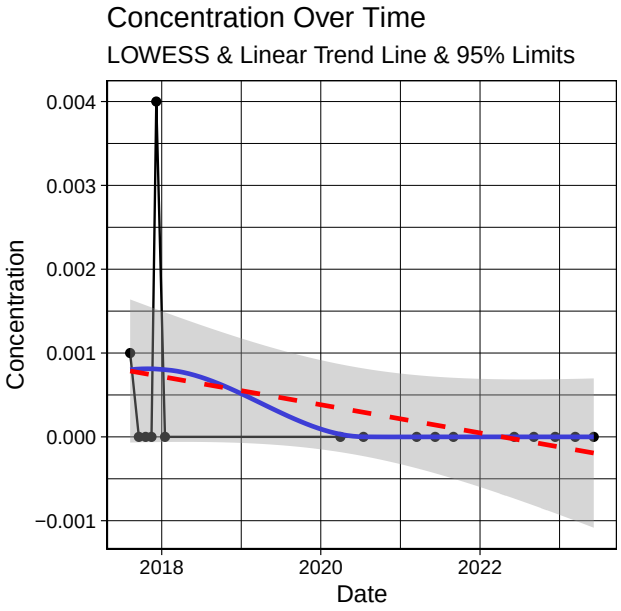
Report for ID : MW196 and Analyte : PFOA

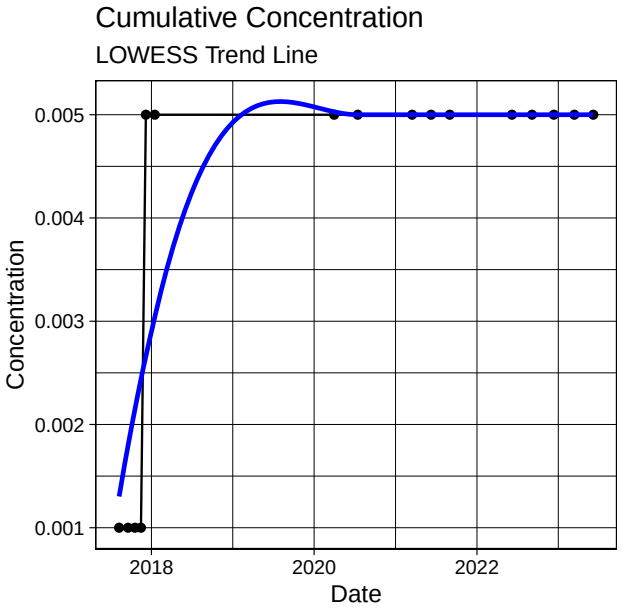




Kendall Trend Test Results Continuous	
n	16
z	-1.58
p	0.11
S	-21
varS	159.67
tau	-0.36
mean	0
sd	0
cov	3.25
results	NO CLEAR TREND

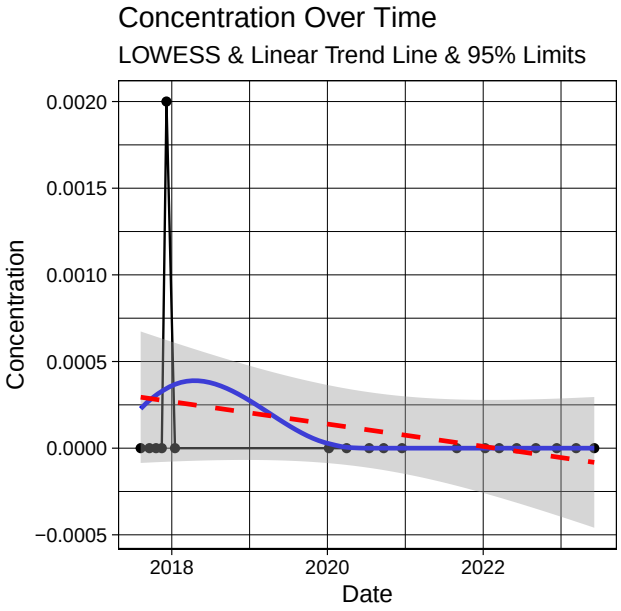
Report for ID : MW197 and Analyte : PFOA

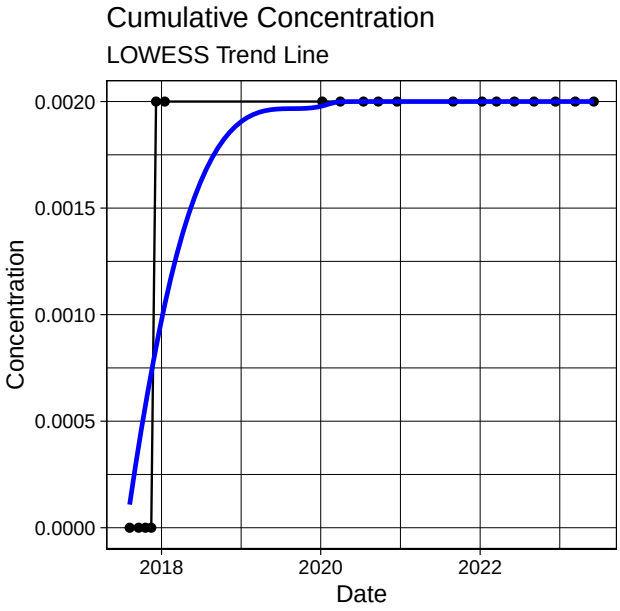




Kendall Trend Test Results Continuous	
n	19
z	-0.82
p	0.41
S	-10
varS	120
tau	-0.18
mean	0
sd	0
cov	4.36
results	NO CLEAR TREND

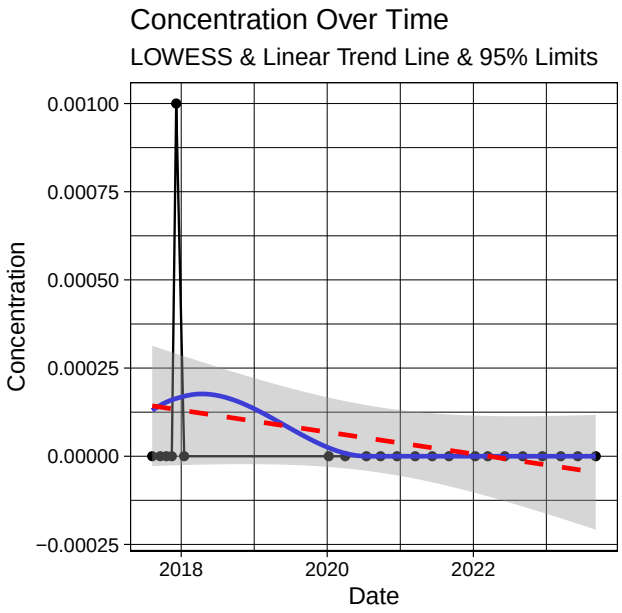
Report for ID : MW199 and Analyte : PFOA

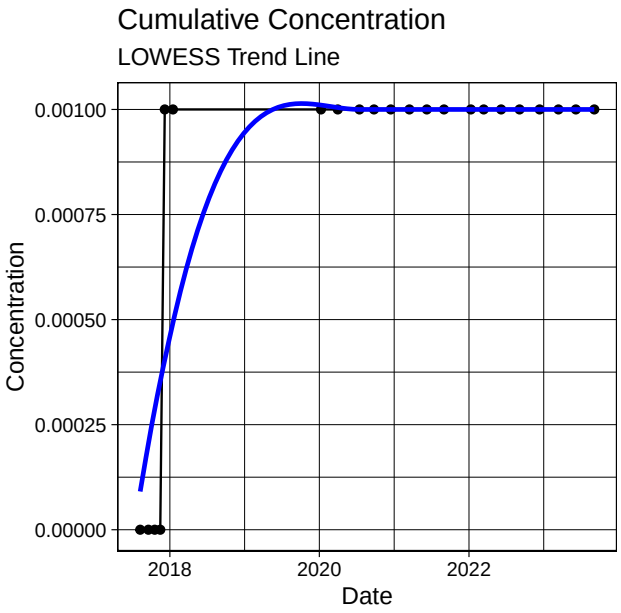




Kendall Trend Test Results Continuous	
n	22
z	-0.95
p	0.34
S	-13
varS	161
tau	-0.19
mean	0
sd	0
cov	4.69
results	NO CLEAR TREND

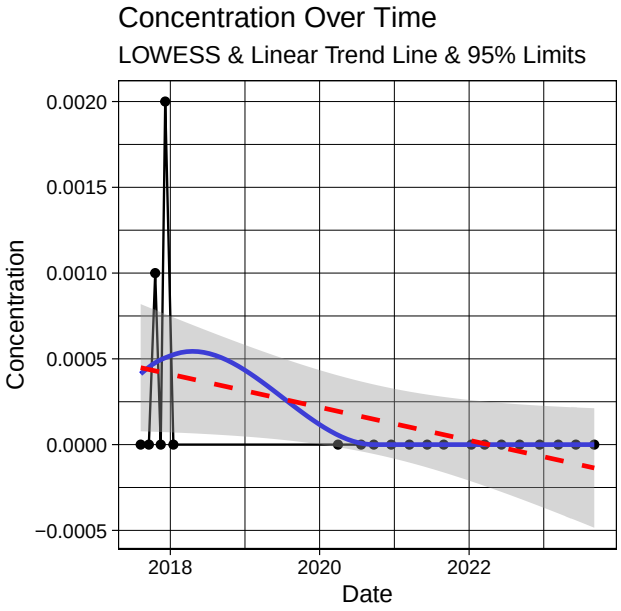
Report for ID : MW200 and Analyte : PFOA

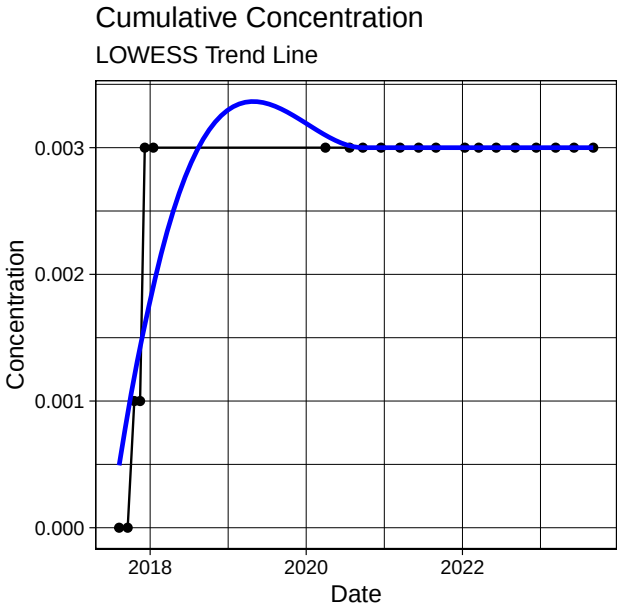




Kendall Trend Test Results Continuous	
n	21
z	-1.55
p	0.12
S	-27
varS	279.67
tau	-0.3
mean	0
sd	0
cov	3.35
results	NO CLEAR TREND

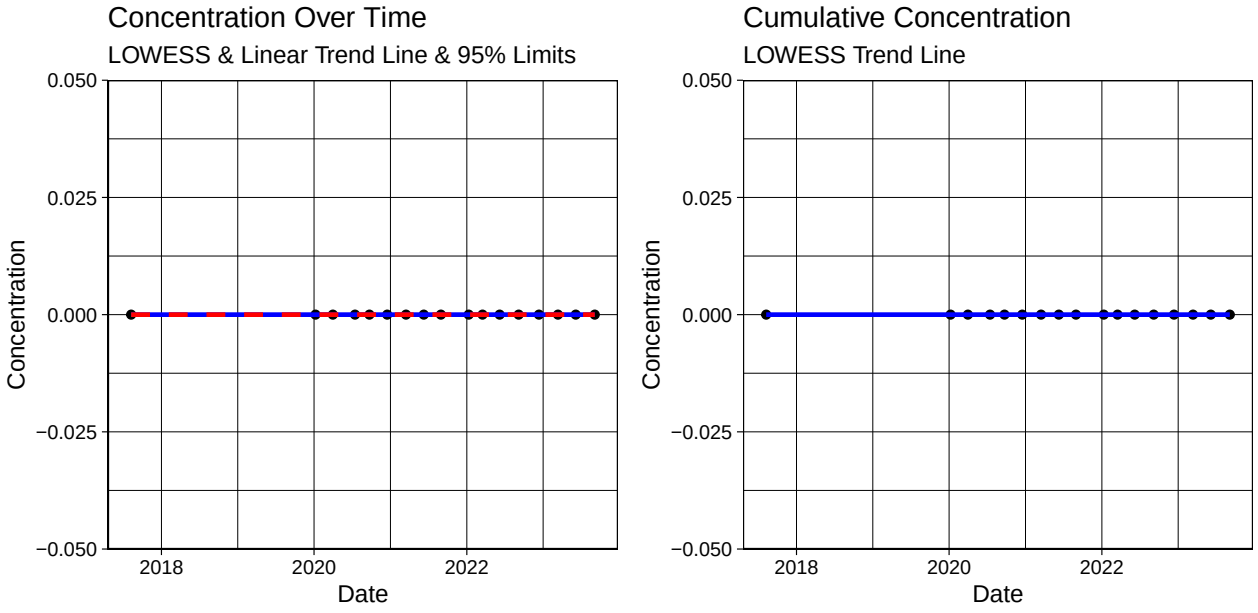
Report for ID : MW202 and Analyte : PFOA





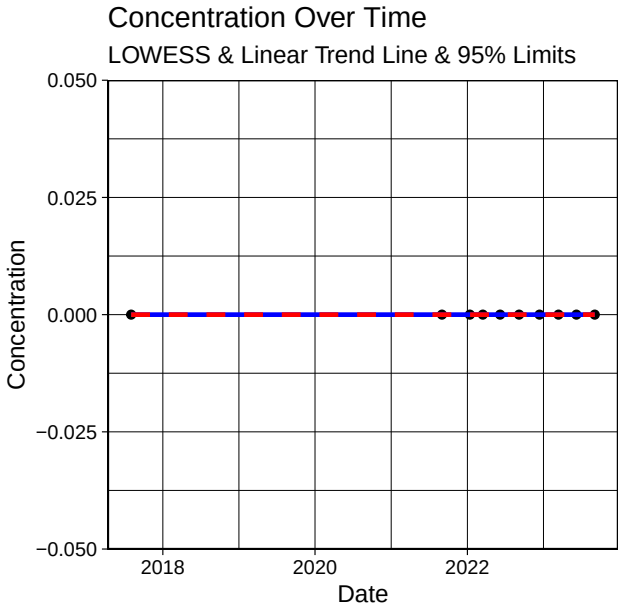
Kendall Trend Test Results Continuous	
n	17
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

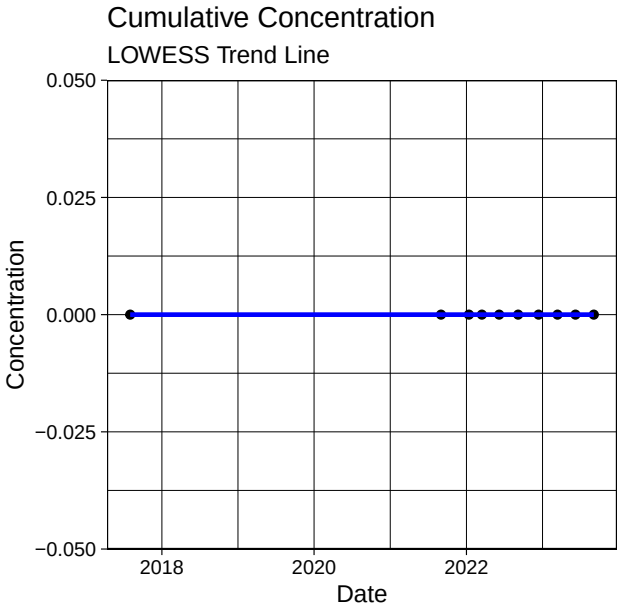
Report for ID : MW203 and Analyte : PFOA



Kendall Trend Test Results Continuous	
n	10
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

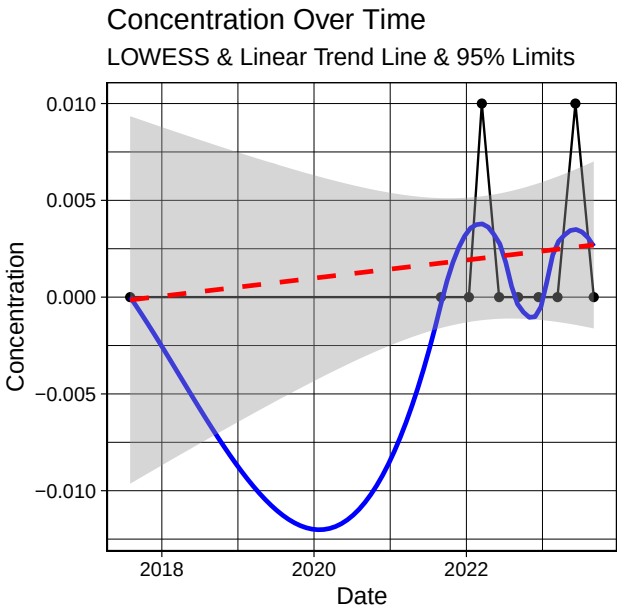
Report for ID : MW214 and Analyte : PFOA

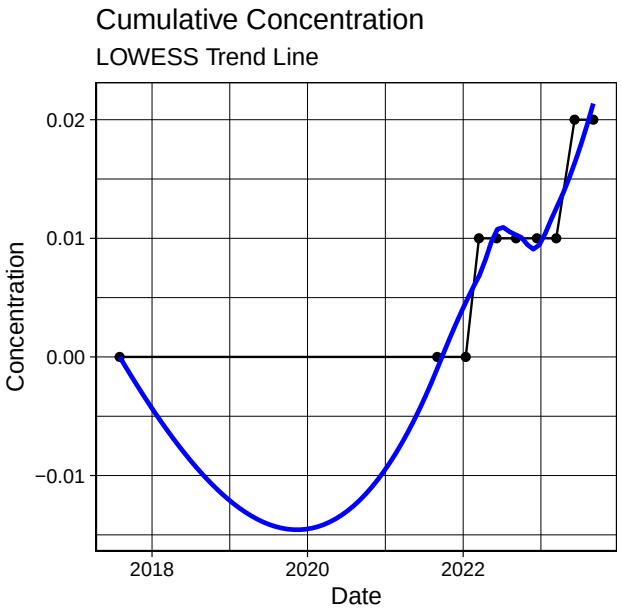




Kendall Trend Test Results Continuous	
n	10
z	0.39
p	0.7
S	4
varS	58.67
tau	0.15
mean	0
sd	0
cov	2.11
results	NO CLEAR TREND

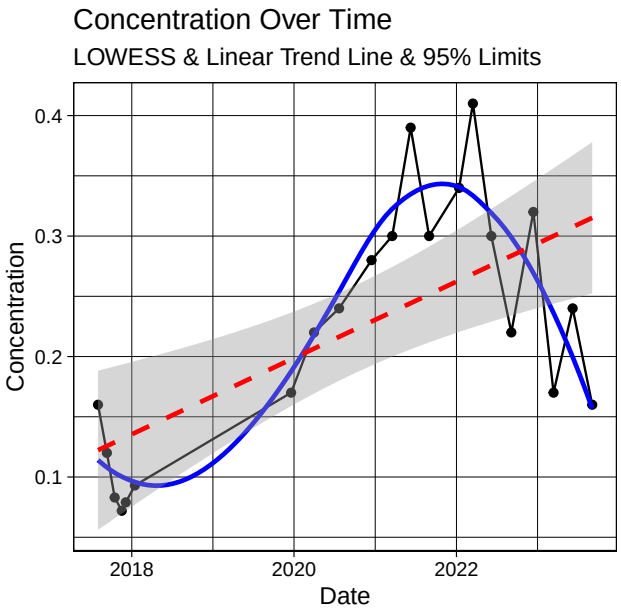
Report for ID : MW215 and Analyte : PFOA

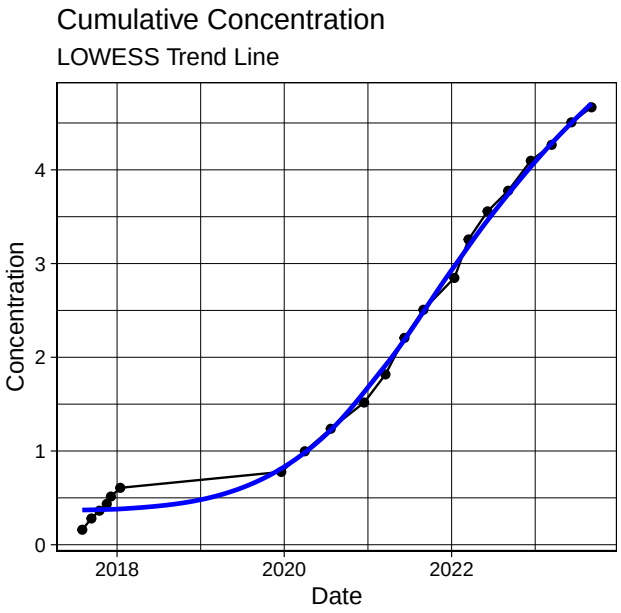




Kendall Trend Test Results Continuous	
n	21
z	2.48
p	0.01
S	83
varS	1089
tau	0.4
mean	0.22
sd	0.1
cov	0.46
results	INCREASING

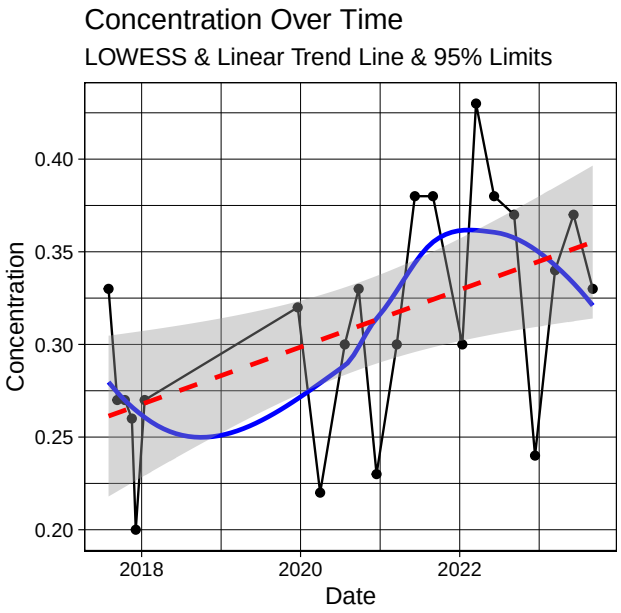
Report for ID : MW216 and Analyte : PFOA

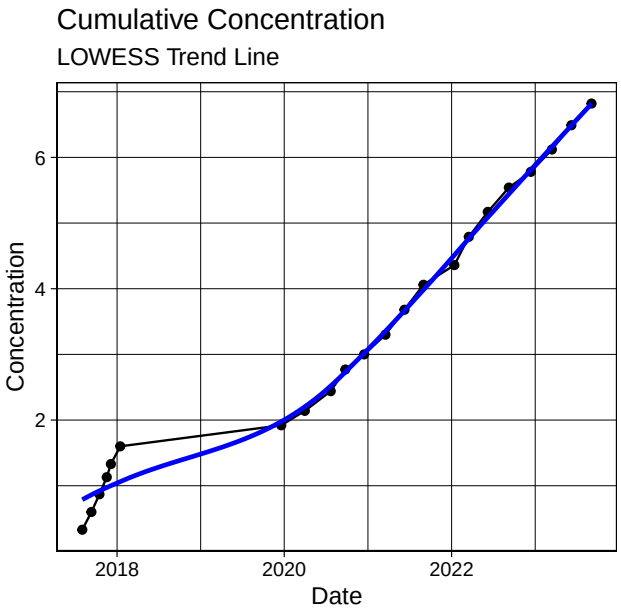




Kendall Trend Test Results Continuous	
n	22
z	2.13
p	0.03
S	76
varS	1242
tau	0.34
mean	0.31
sd	0.06
cov	0.2
results	INCREASING

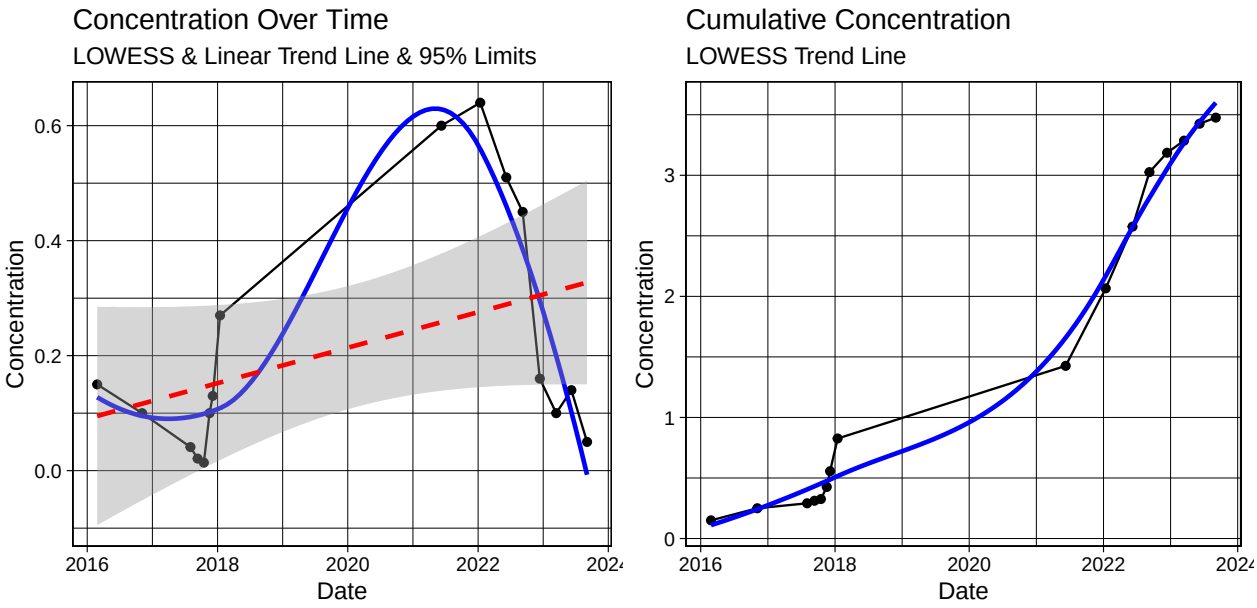
Report for ID : MW217 and Analyte : PFOA





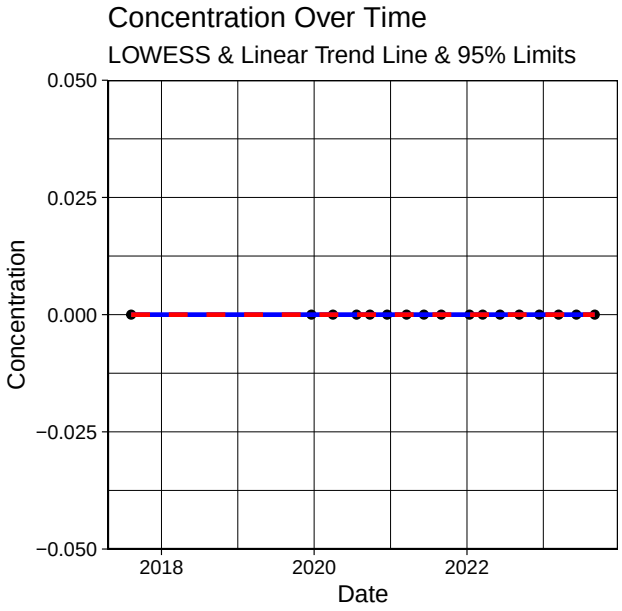
Kendall Trend Test Results Continuous	
n	16
z	0.81
p	0.42
S	19
varS	489.67
tau	0.16
mean	0.22
sd	0.21
cov	0.97
results	NO CLEAR TREND

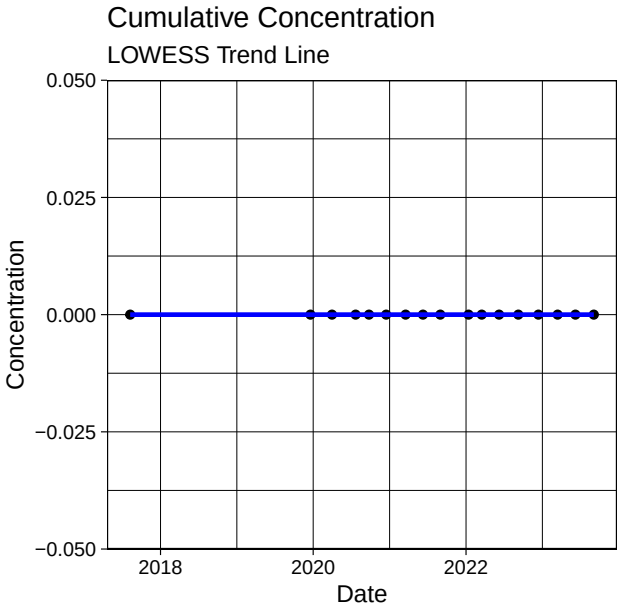
Report for ID : MW220 and Analyte : PFOA



Kendall Trend Test Results Continuous	
n	17
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

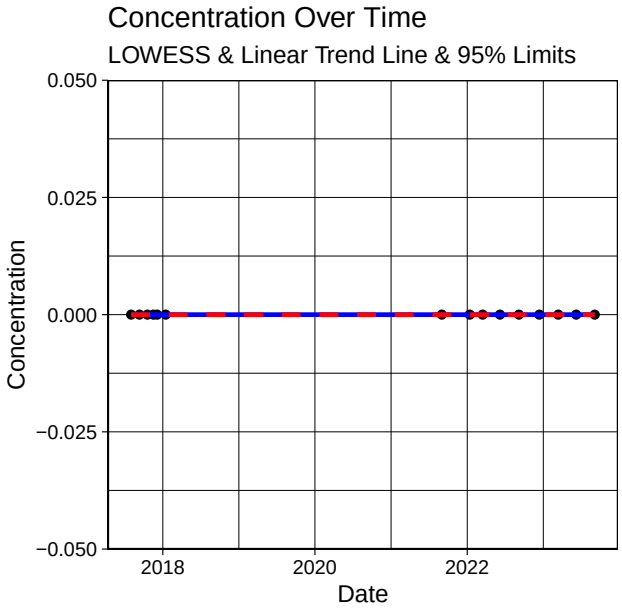
Report for ID : MW224 and Analyte : PFOA

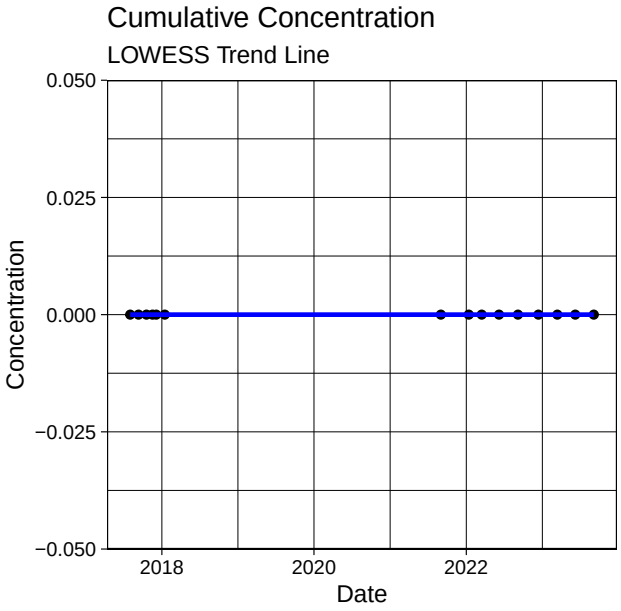




Kendall Trend Test Results Continuous	
n	15
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

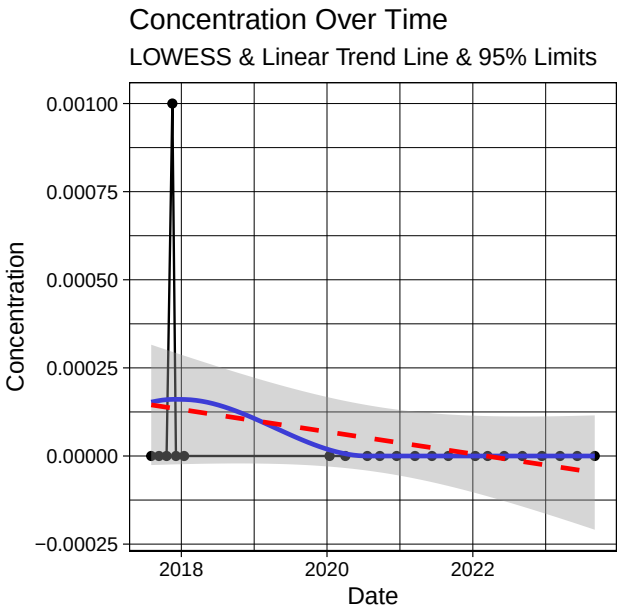
Report for ID : MW225 and Analyte : PFOA

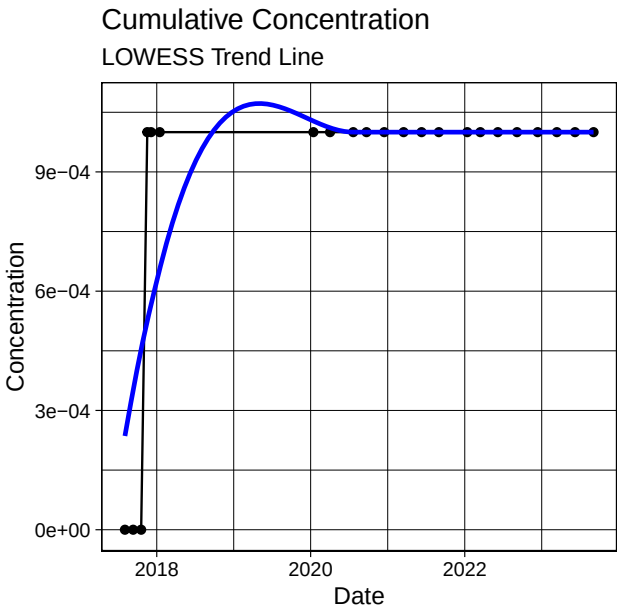




Kendall Trend Test Results Continuous	
n	22
z	-1.1
p	0.27
S	-15
varS	161
tau	-0.22
mean	0
sd	0
cov	4.69
results	NO CLEAR TREND

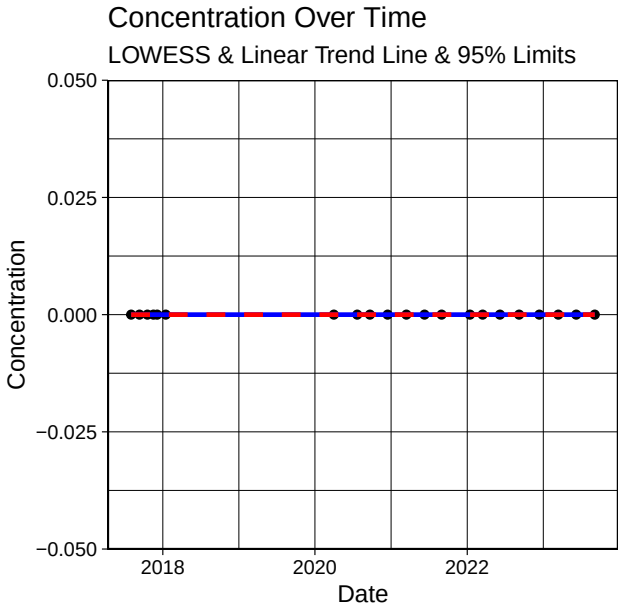
Report for ID : MW226 and Analyte : PFOA

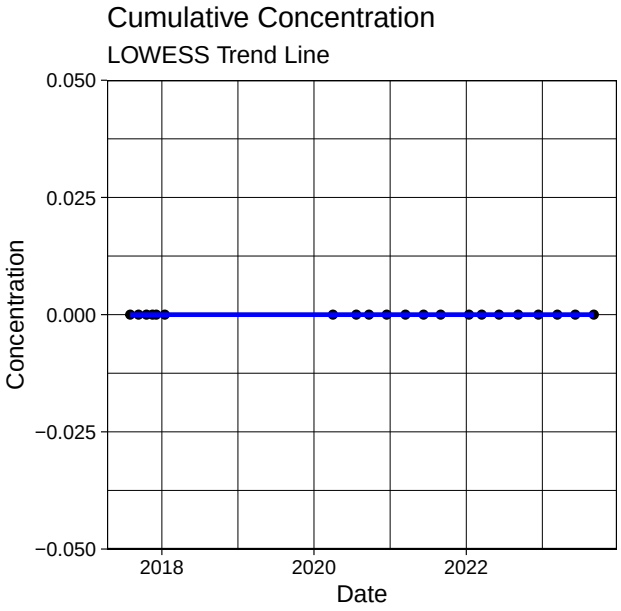




Kendall Trend Test Results Continuous	
n	21
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

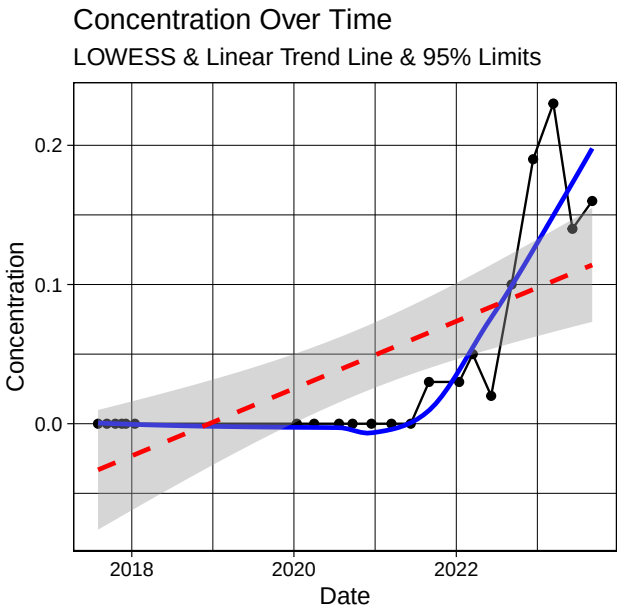
Report for ID : MW227 and Analyte : PFOA

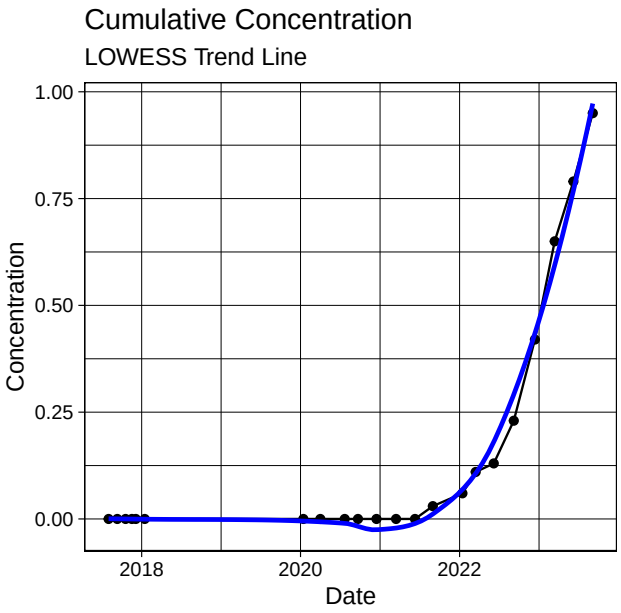




Kendall Trend Test Results Continuous	
n	22
z	4.36
p	0
S	138
varS	988
tau	0.74
mean	0.04
sd	0.07
cov	1.66
results	INCREASING

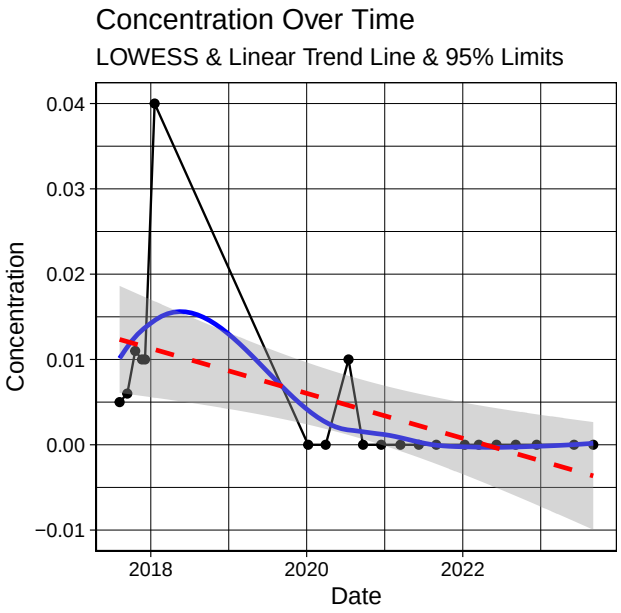
Report for ID : MW228 and Analyte : PFOA

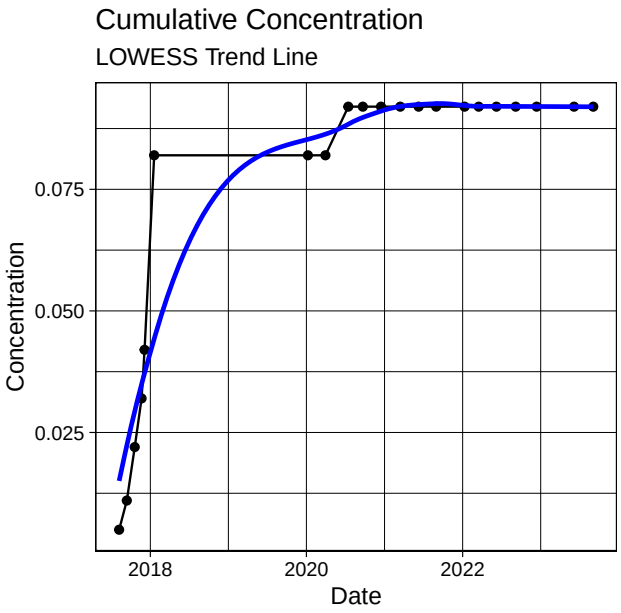




Kendall Trend Test Results Continuous	
n	21
z	-3.01
p	0
S	-84
varS	759.33
tau	-0.54
mean	0
sd	0.01
cov	2.09
results	DECREASING

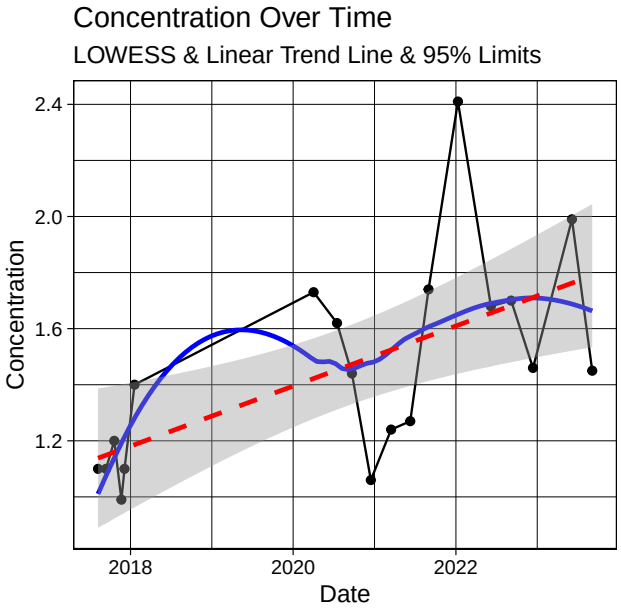
Report for ID : MW233 and Analyte : PFOA

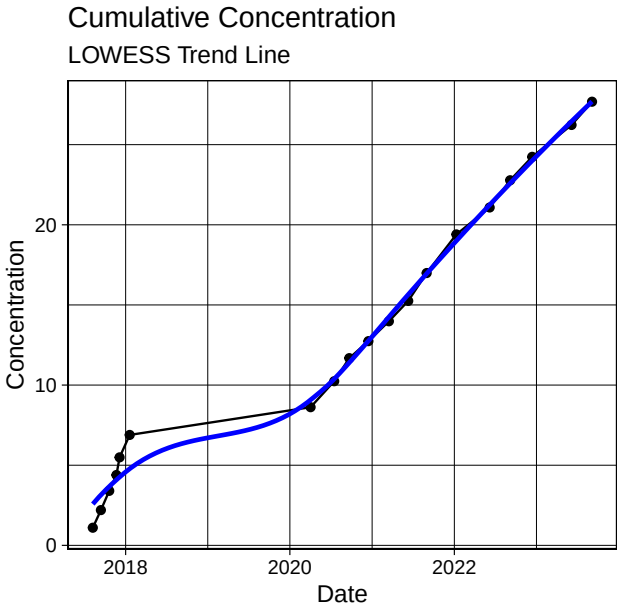




Kendall Trend Test Results Continuous	
n	19
z	2.77
p	0.01
S	80
varS	813.33
tau	0.47
mean	1.46
sd	0.36
cov	0.25
results	INCREASING

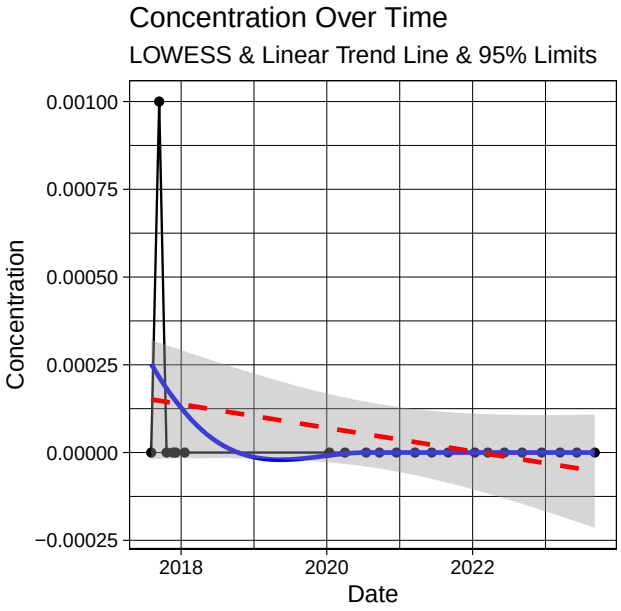
Report for ID : MW236 and Analyte : PFOA

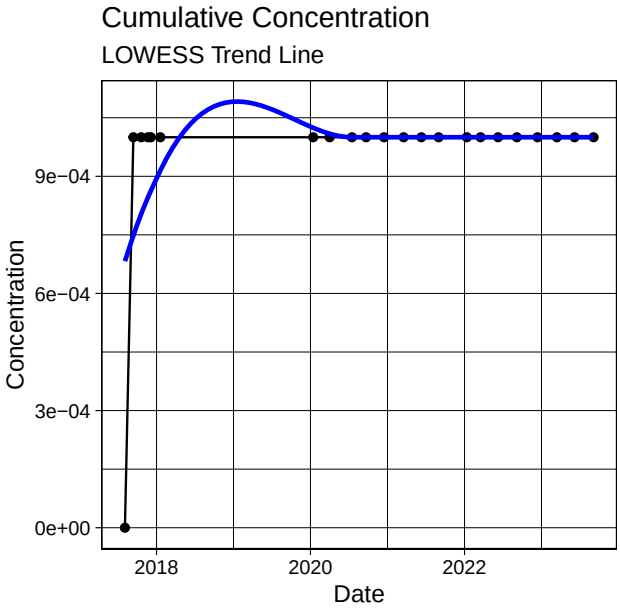




Kendall Trend Test Results Continuous	
n	22
z	-1.42
p	0.16
S	-19
varS	161
tau	-0.27
mean	0
sd	0
cov	4.69
results	NO CLEAR TREND

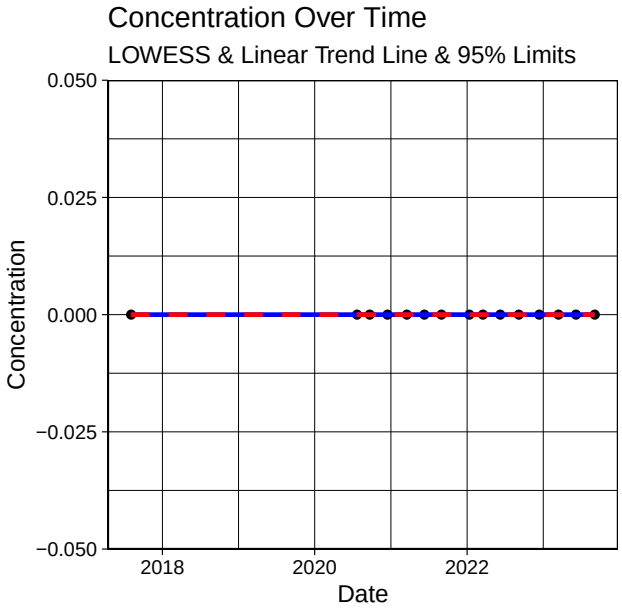
Report for ID : MW238 and Analyte : PFOA

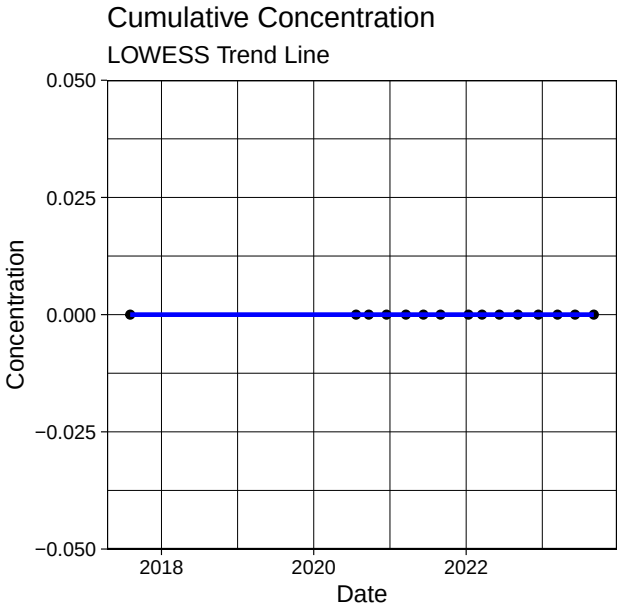




Kendall Trend Test Results Continuous	
n	15
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

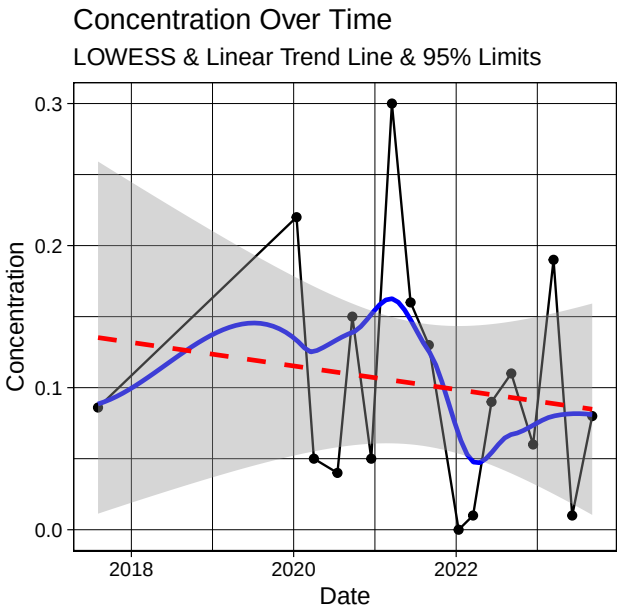
Report for ID : MW239 and Analyte : PFOA

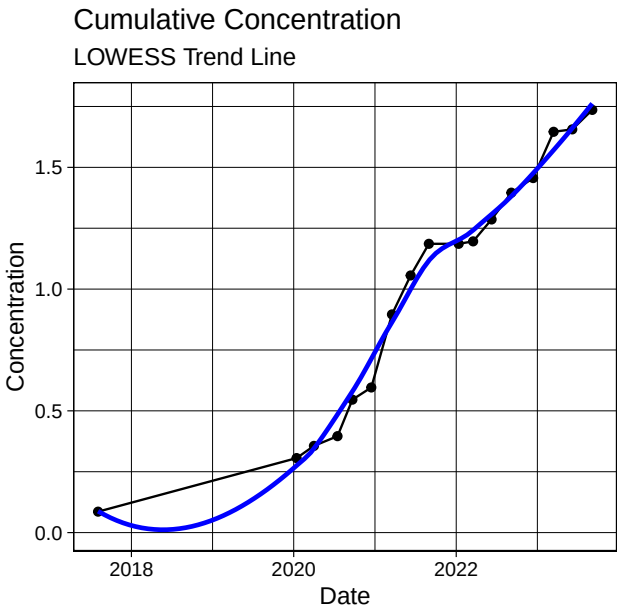




Kendall Trend Test Results Continuous	
n	17
z	-0.62
p	0.54
S	-16
varS	587.33
tau	-0.12
mean	0.1
sd	0.08
cov	0.8
results	STABLE

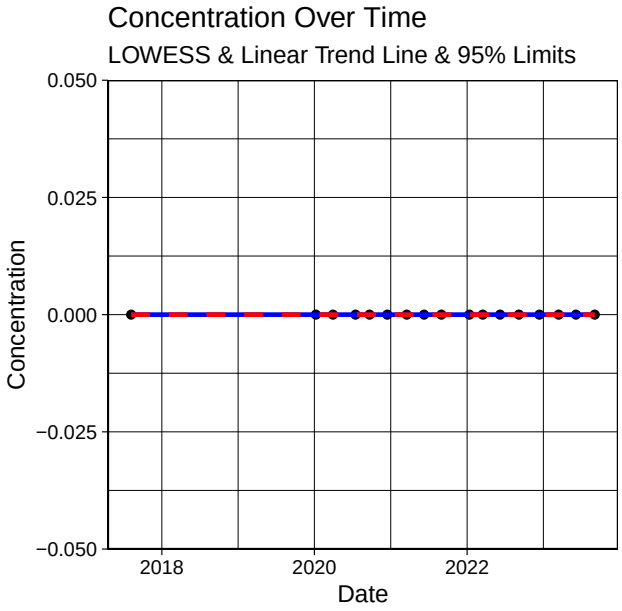
Report for ID : MW240 and Analyte : PFOA

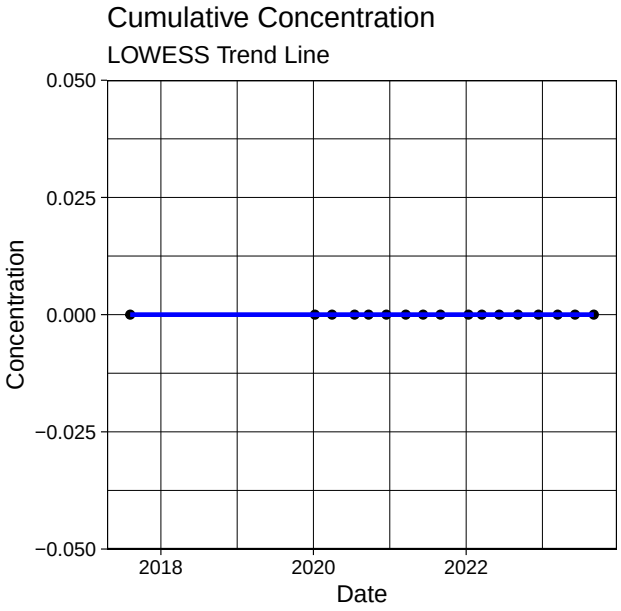




Kendall Trend Test Results Continuous	
n	17
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

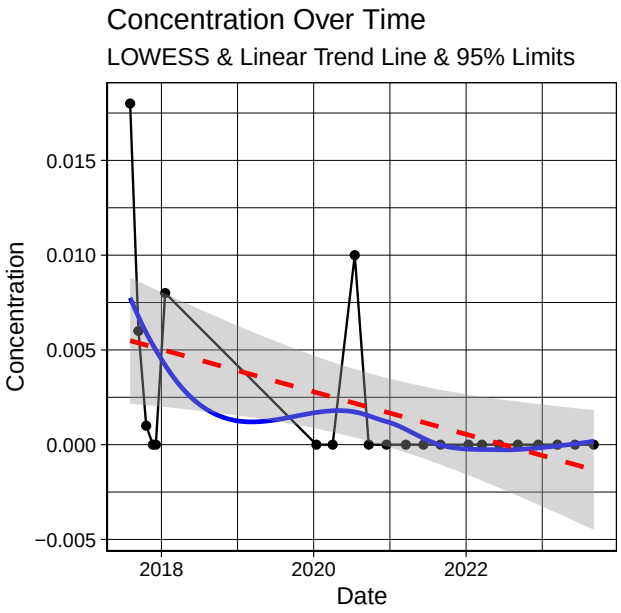
Report for ID : MW242 and Analyte : PFOA

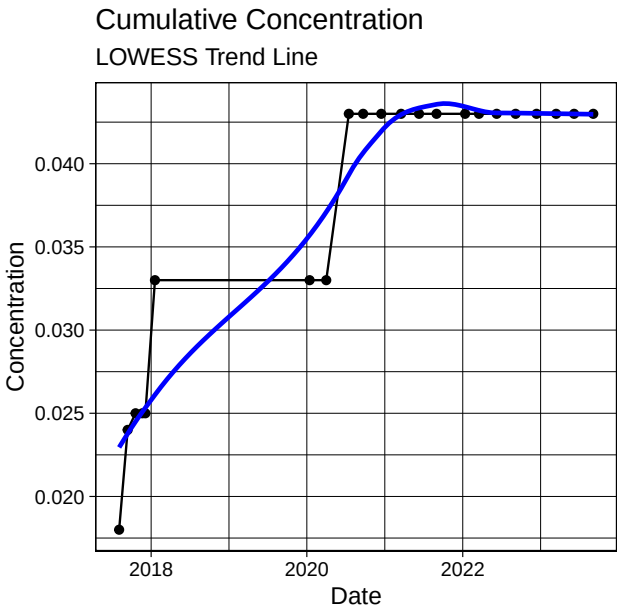




Kendall Trend Test Results Continuous	
n	22
z	-2.79
p	0.01
S	-73
varS	668.33
tau	-0.49
mean	0
sd	0
cov	2.34
results	DECREASING

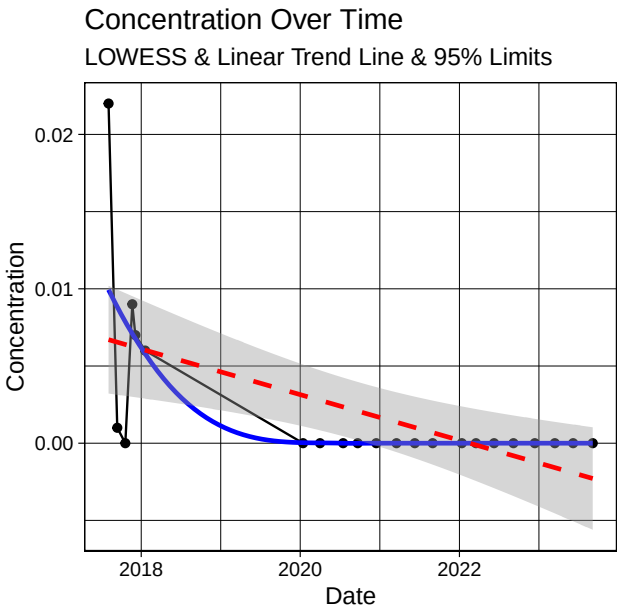
Report for ID : MW243 and Analyte : PFOA

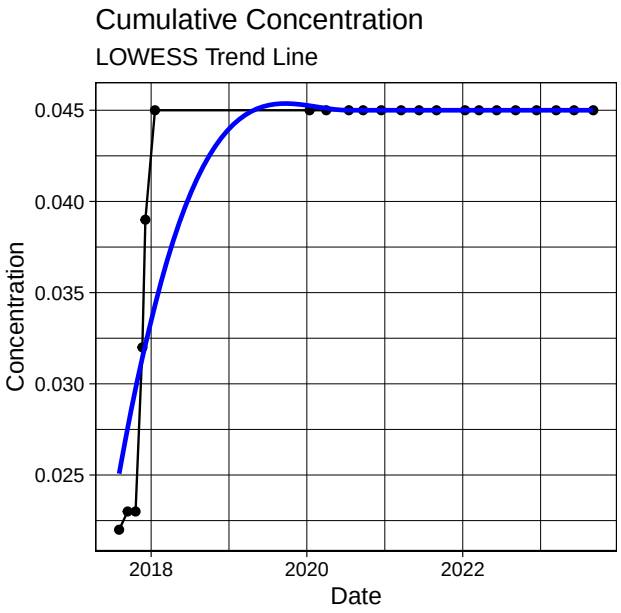




Kendall Trend Test Results Continuous	
n	22
z	-3.17
p	0
S	-83
varS	668.33
tau	-0.56
mean	0
sd	0.01
cov	2.52
results	DECREASING

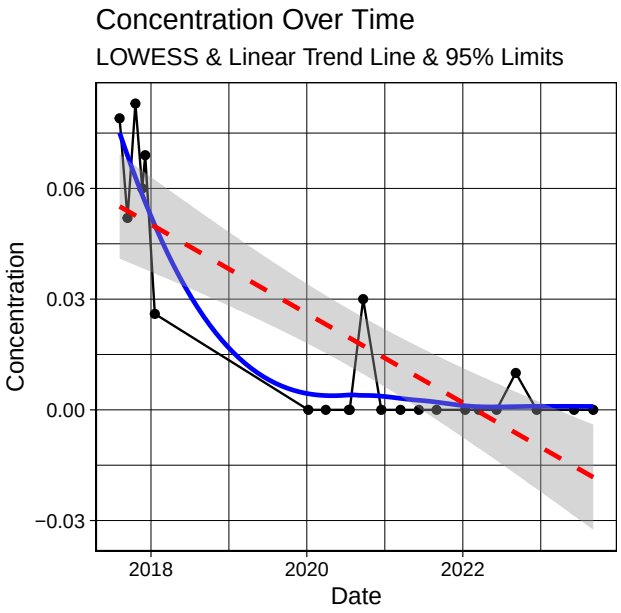
Report for ID : MW245 and Analyte : PFOA

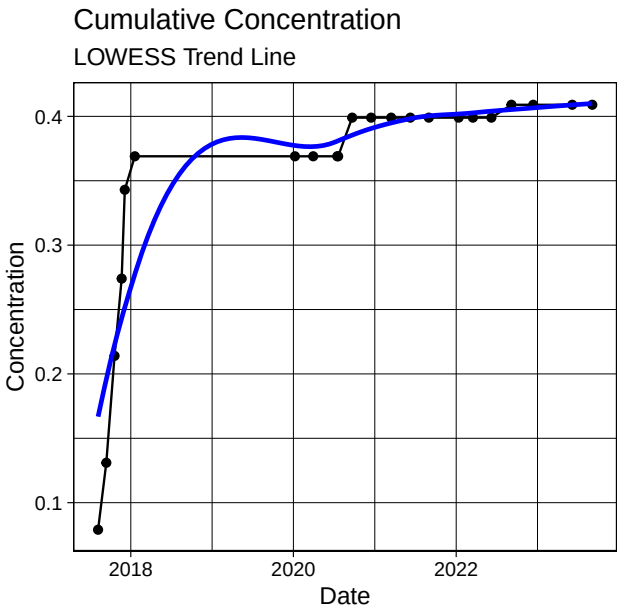




Kendall Trend Test Results Continuous	
n	22
z	-3.19
p	0
S	-98
varS	924
tau	-0.54
mean	0.02
sd	0.03
cov	1.59
results	DECREASING

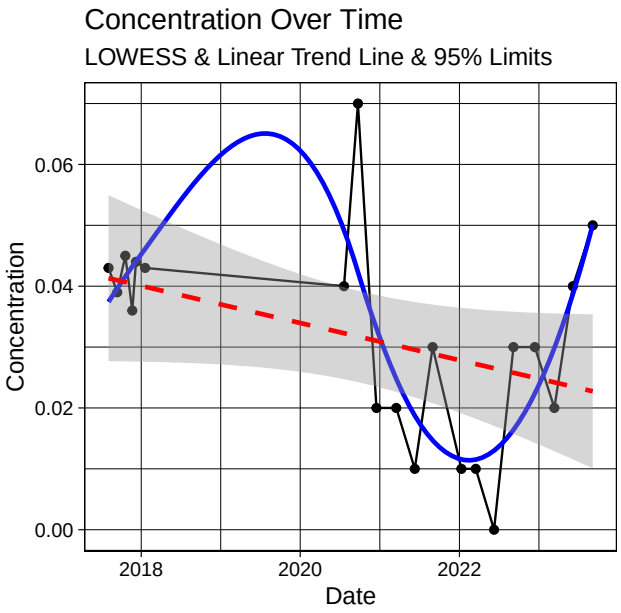
Report for ID : MW249 and Analyte : PFOA

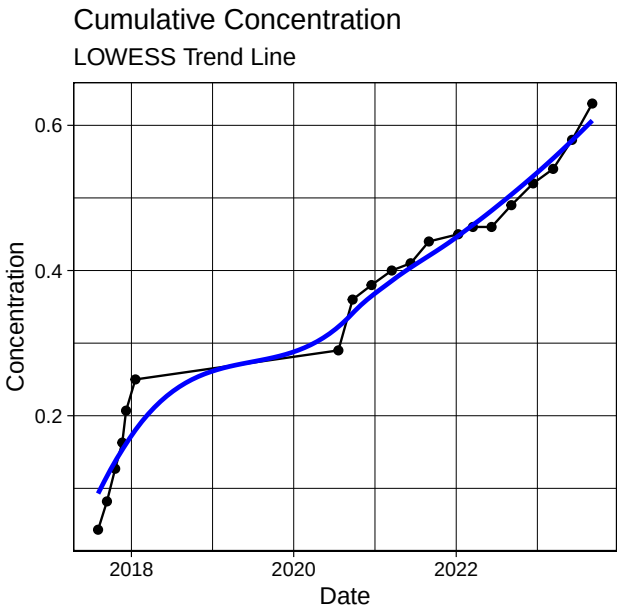




Kendall Trend Test Results Continuous	
n	20
z	-1.57
p	0.12
S	-49
varS	937
tau	-0.27
mean	0.03
sd	0.02
cov	0.54
results	STABLE

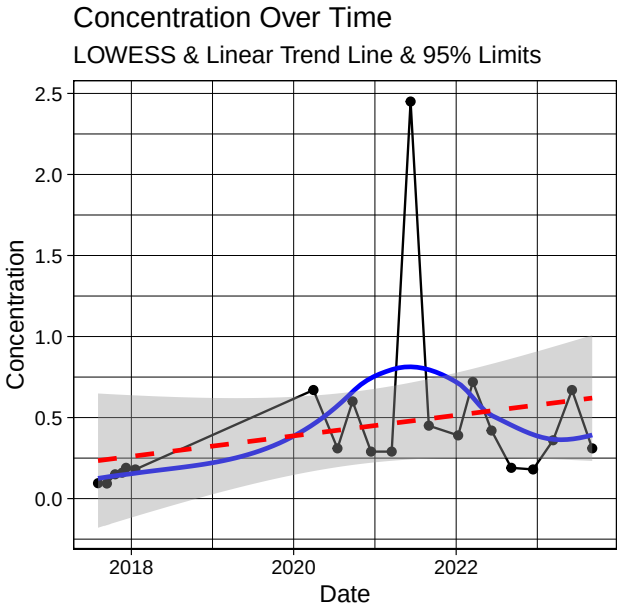
Report for ID : MW255 and Analyte : PFOA

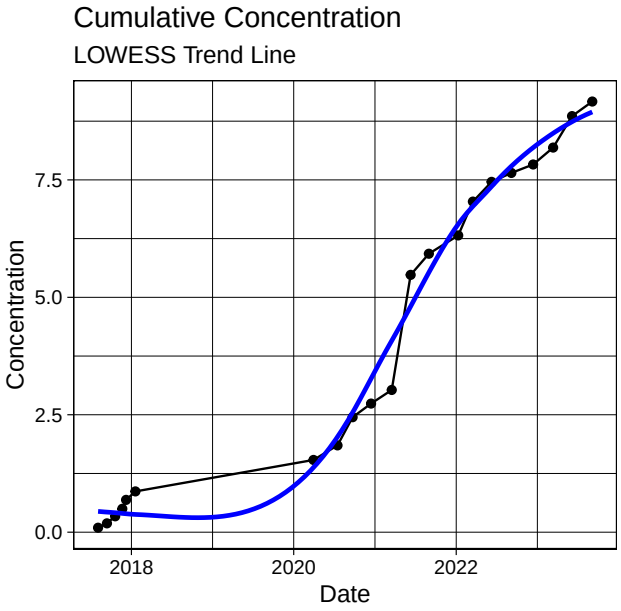




Kendall Trend Test Results Continuous	
n	21
z	2.36
p	0.02
S	79
varS	1091.67
tau	0.38
mean	0.44
sd	0.5
cov	1.15
results	INCREASING

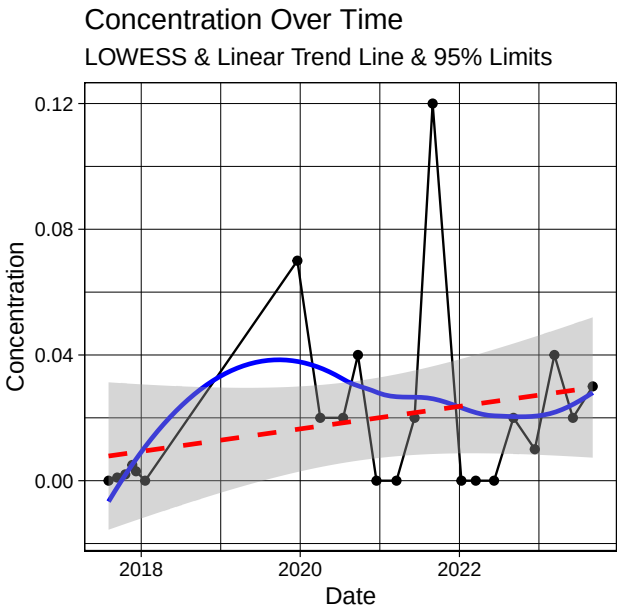
Report for ID : MW256 and Analyte : PFOA

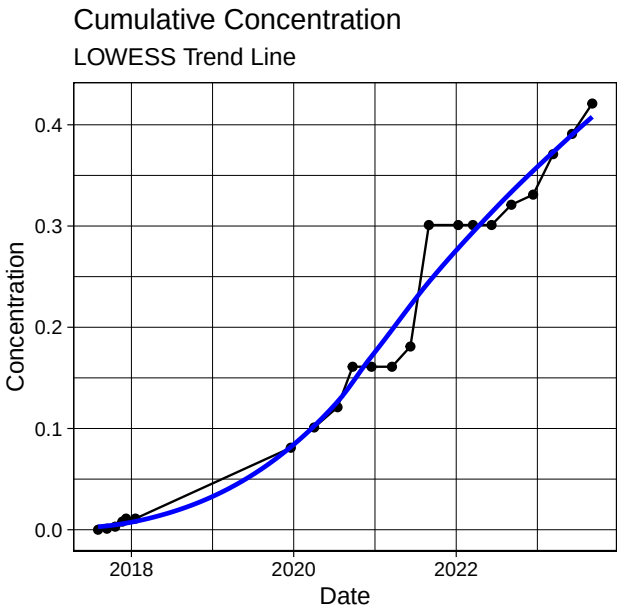




Kendall Trend Test Results Continuous	
n	22
z	1.33
p	0.18
S	47
varS	1195.67
tau	0.22
mean	0.02
sd	0.03
cov	1.51
results	NO CLEAR TREND

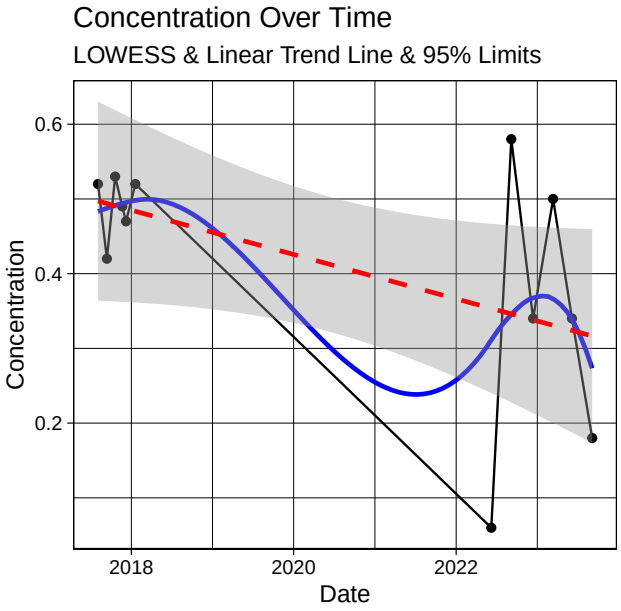
Report for ID : MW257 and Analyte : PFOA

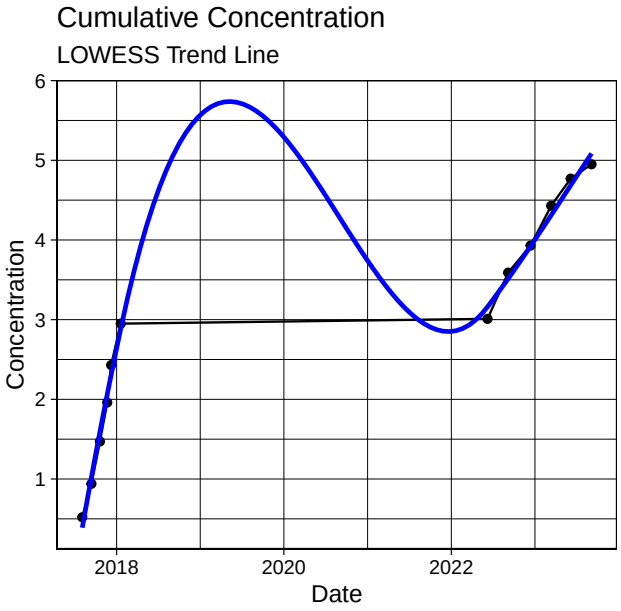




Kendall Trend Test Results Continuous	
n	12
z	-1.31
p	0.19
S	-20
varS	210.67
tau	-0.31
mean	0.41
sd	0.16
cov	0.38
results	STABLE

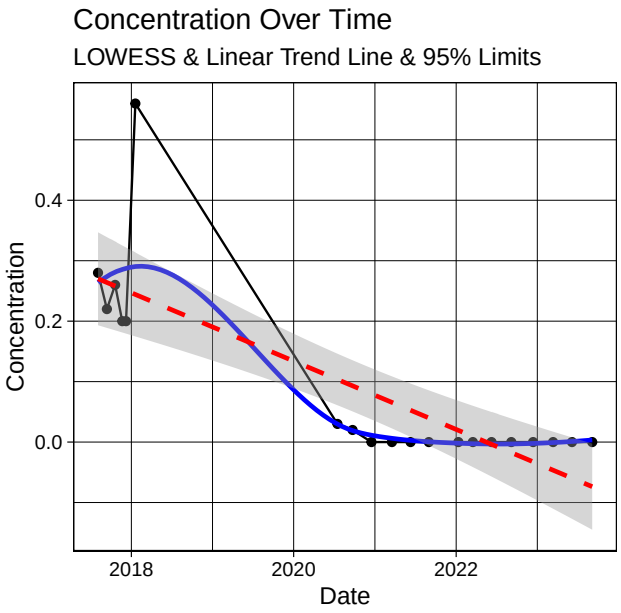
Report for ID : MW258 and Analyte : PFOA

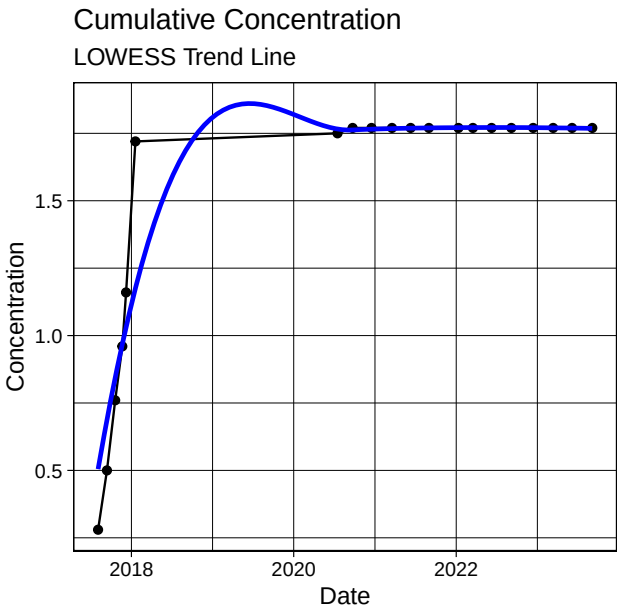




Kendall Trend Test Results Continuous	
n	20
z	-4.05
p	0
S	-111
varS	736.33
tau	-0.73
mean	0.09
sd	0.15
cov	1.71
results	DECREASING

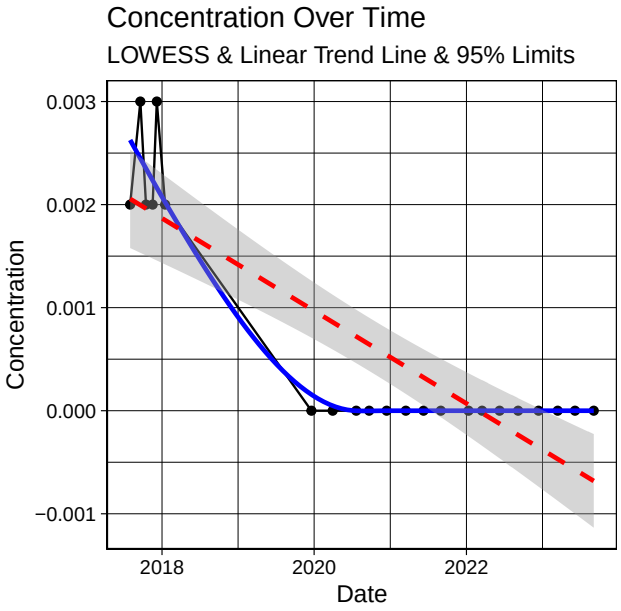
Report for ID : MW259 and Analyte : PFOA

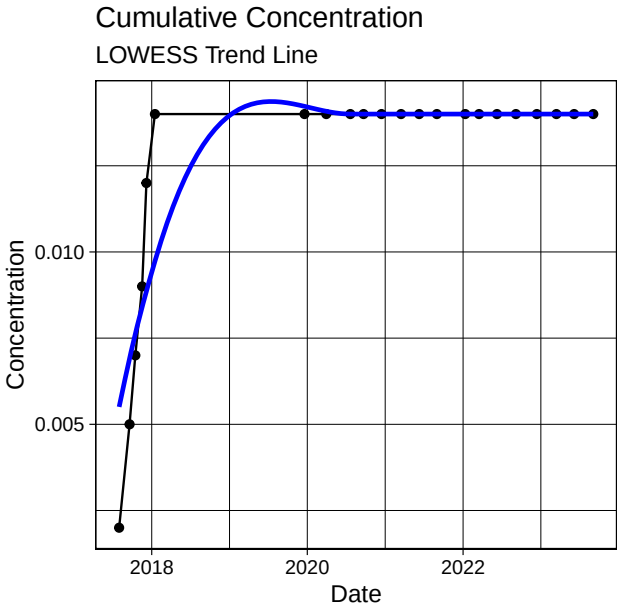




Kendall Trend Test Results Continuous	
n	22
z	-3.46
p	0
S	-96
varS	754.67
tau	-0.62
mean	0
sd	0
cov	1.72
results	DECREASING

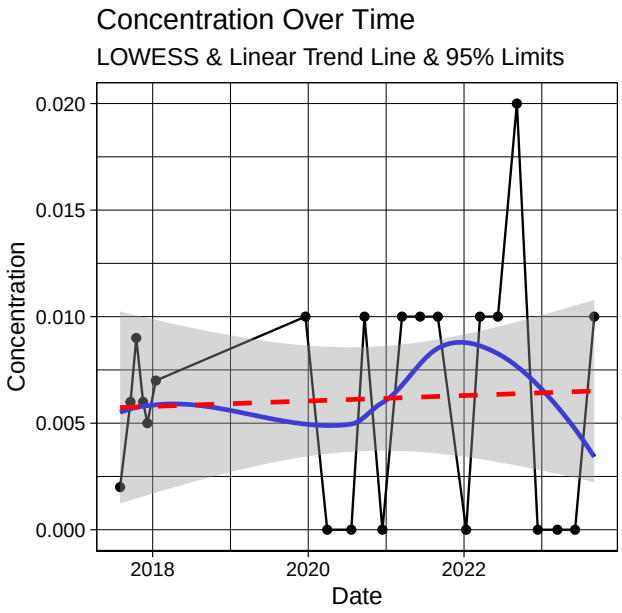
Report for ID : MW268 and Analyte : PFOA

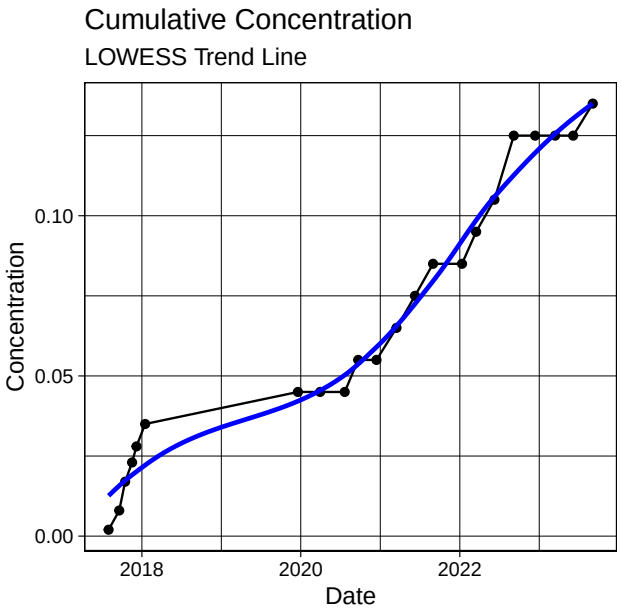




Kendall Trend Test Results Continuous	
n	22
z	0.53
p	0.6
S	19
varS	1147
tau	0.09
mean	0.01
sd	0.01
cov	0.87
results	NO CLEAR TREND

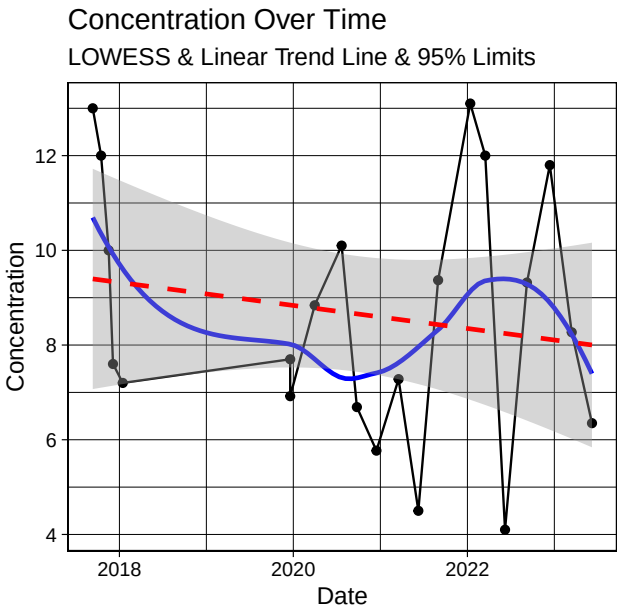
Report for ID : MW269 and Analyte : PFOA

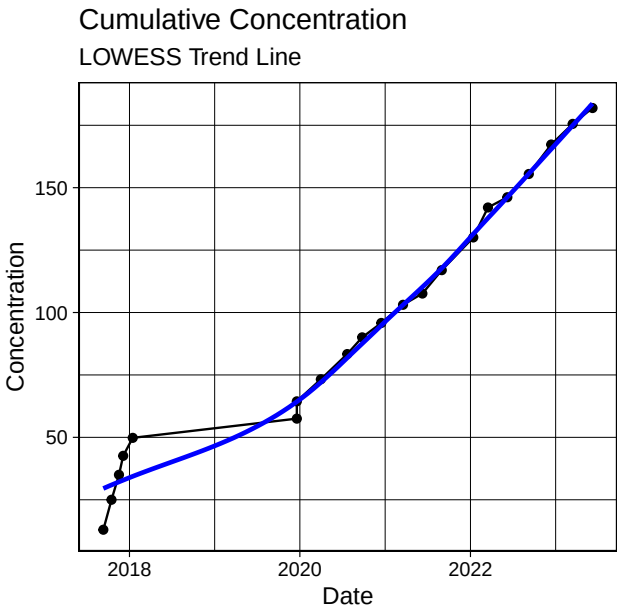




Kendall Trend Test Results Continuous	
n	21
z	-1.03
p	0.3
S	-35
varS	1095.67
tau	-0.17
mean	8.66
sd	2.65
cov	0.31
results	STABLE

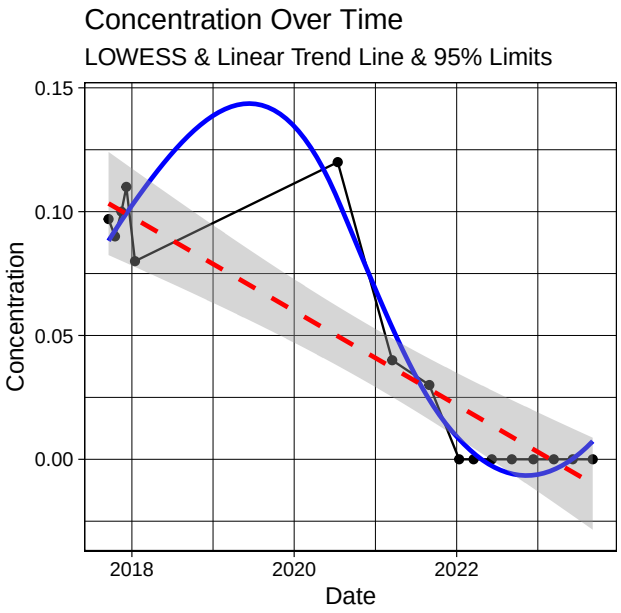
Report for ID : MW282 and Analyte : PFOA

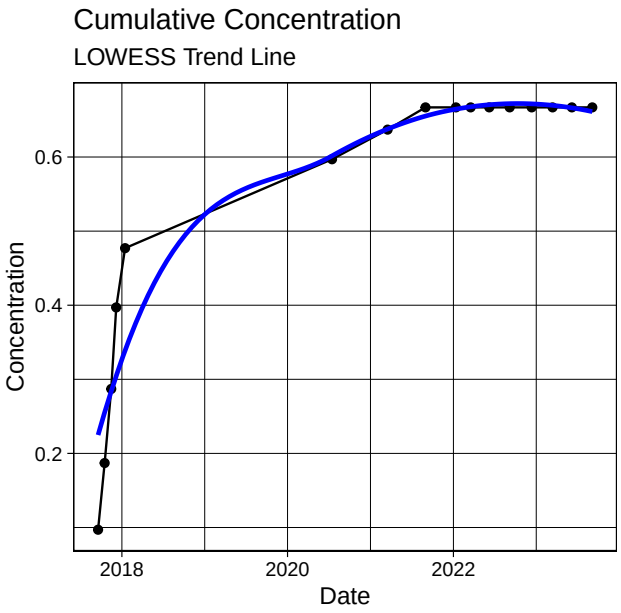




Kendall Trend Test Results Continuous	
n	16
z	-3.43
p	0
S	-72
varS	428
tau	-0.69
mean	0.04
sd	0.05
cov	1.16
results	DECREASING

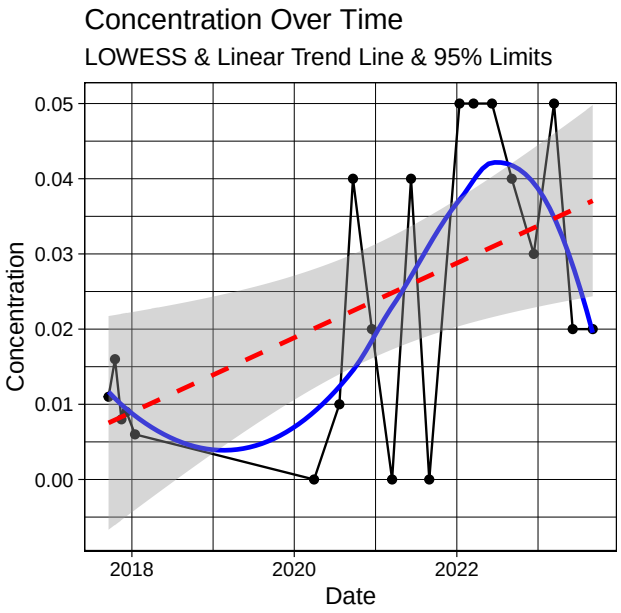
Report for ID : MW288 and Analyte : PFOA

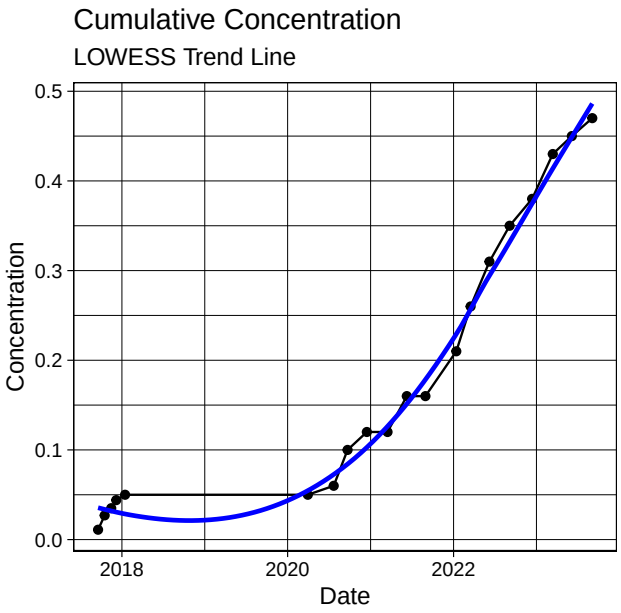




Kendall Trend Test Results Continuous	
n	20
z	1.9
p	0.06
S	59
varS	930.33
tau	0.32
mean	0.02
sd	0.02
cov	0.79
results	POSSIBLY INCREASING

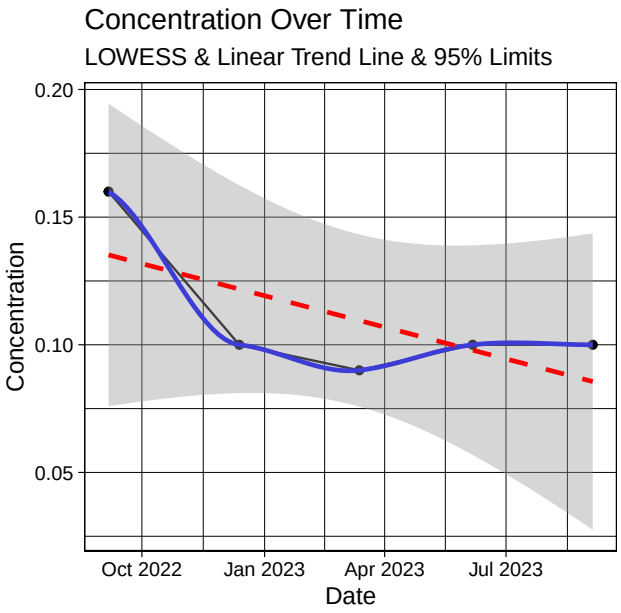
Report for ID : MW289 and Analyte : PFOA

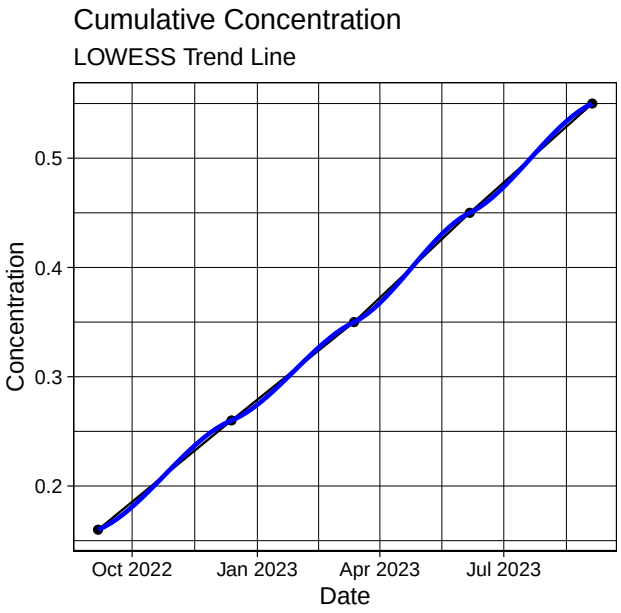




Kendall Trend Test Results Continuous	
n	5
z	-0.55
p	0.58
S	-3
varS	13
tau	-0.36
mean	0.11
sd	0.03
cov	0.26
results	STABLE

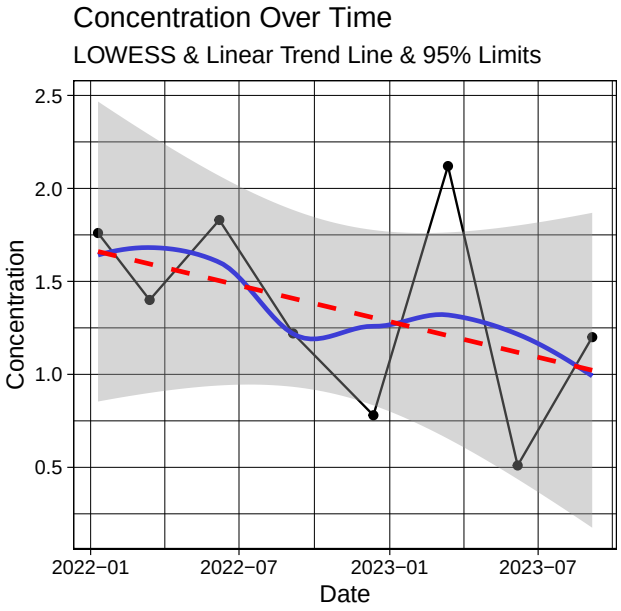
Report for ID : MW496 and Analyte : PFOA

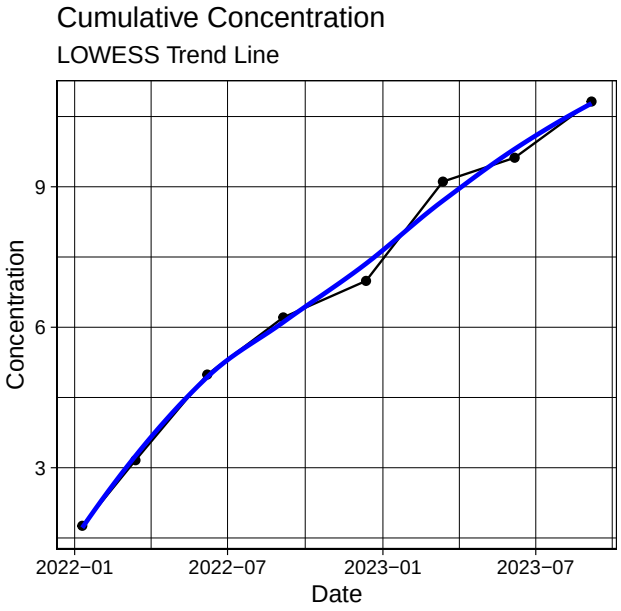


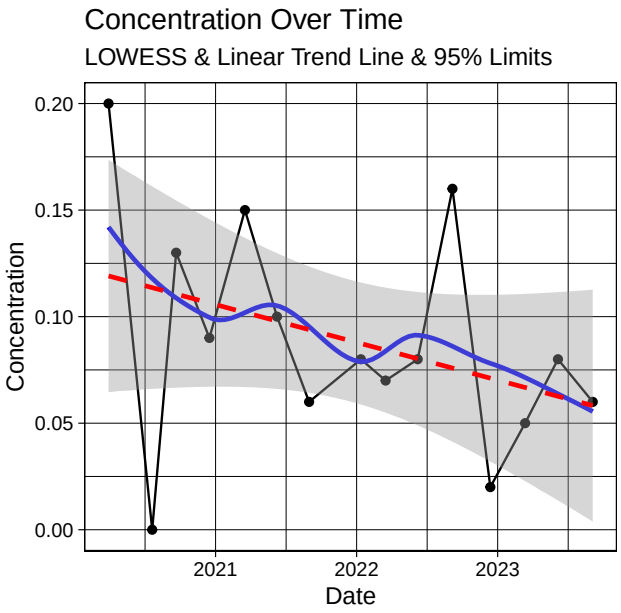
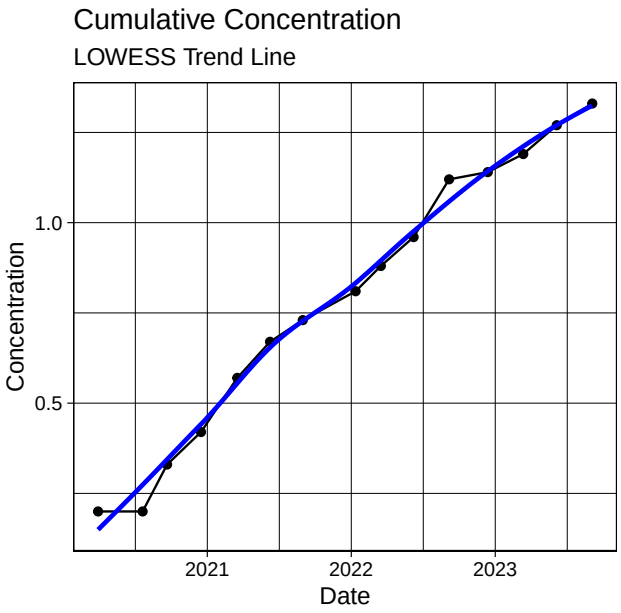


Kendall Trend Test Results Continuous	
n	8
z	-1.11
p	0.27
S	-10
varS	65.33
tau	-0.36
mean	1.35
sd	0.54
cov	0.4
results	STABLE

Report for ID : MW500 and Analyte : PFOA





Kendall Trend Test Results Continuous	
n	15
z	-1.49
p	0.14
S	-31
varS	403.67
tau	-0.3
mean	0.09
sd	0.05
cov	0.6
results	STABLE

Report for ID : MW516 and Analyte : PFOA